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Speech Correction In The U.S.S.R.

Martha E. Black

The Institute of Defectology in Moscow is the official headquarters of the services for all exceptional children in the U.S.S.R. We had an opportunity recently to visit this office and to discuss the various programs with the persons who have the planning and the administrative responsibilities. Although we learned something about the work done for all types of handicapped children, we spent most of our time with the people interested in speech correction. We were given a book, *My Experience in Logoped Work* (*1*), containing a collection of papers which had been presented at a speech correction convention. What we learned from the translation of these lectures and what we gathered from our discussions at the Institute are the sources for the following observations.

Program

Depending on the type and degree of his handicapping condition, the exceptional child in the Soviet Union is the responsibility of one of three different ministries. The children for whom there is little hope of rehabilitation are given institutional care by the Ministry of Social Security. Those whose prime problems are medical belong to the Ministry of Health, while the Ministry of Education provides specialized work for those who may be educated to degrees determined by individual abilities. In many instances, these ministries may cooperate in providing the services. The child with a speech defect is regarded first, in the usual European fashion, as a child with medical problems; however, the actual speech rehabilitation is the responsibility of the Ministry of Education.

Departments for training in speech correction are sections of the pedagogical institutes where teachers of exceptional children are educated. Graduates from these institutes receive 25 per cent more pay than the teachers of normal children. The salary and inducements which are given to all teachers, such as preference in securing housing and an honored social position, help make teaching the handicapped a desired profession. When we mentioned our teacher shortage and asked whether the same difficulty existed in Russia, we were told, 'We train all the teachers we need.'

Speech correction in the U.S.S.R. is organized much the same as it is in the U.S.A. The school correctionist, called a *logoped*, sees the pupils two or three times a week; however, she may take only the relatively minor problems. More serious cases usually are sent to clinics. The services in the schools as well as in the clinics are under the direction of a medical person. Every school has its doctor, dentist, nurse and social workers. It is the

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responsibility of the *logoped* to demonstrate the need for speech correction and to establish its goals. The *logoped* is expected, also, to interpret the program to the public as well as to other professional people.

The original examination of a child includes the analysis of the speech, an evaluation of the hearing by either the correctionist or a medical person, a test by a psychoneurologist if the intelligence is questioned, and, interestingly, an examination of the written work of the child when such is available. The frequent references made to writing indicate that it is believed to be closely related to speech. In becoming acquainted with the child, the *logoped* consults with the parents and studies the school records together with the medical history. The importance of these records is emphasized in all the papers. When problems in hearing or in intelligence are found, the *logoped* works closely with the audiologist or the neuropathologist.

Speech correction lessons are planned one month in advance, and then they are divided into days and the exact plan for each day is specified. There are daily records kept of each child's difficulties or successes. Assignments are sent home and the parents are kept informed regarding the work. The notebook in which are kept the expected data such as name, age, address, grade, diagnosis, attendance, and speech progress also contains information on pronunciation, reading and writing. When help is given to lay persons interested in the child, records are made of the time spent, the theme discussed, and the results obtained. Periodical reports are made to the superintendent of schools and to the inspector of the department of special education. The reports include information on the number of schools served, condition of rooms and equipment, the number of children, the grade distribution, group and individual work, data on the effectiveness of *logopedic* help, effect on general school progress, talks with mothers, and consultation with specialists.

Two unique notations are made. One concerns the pupil's connection with the 'Pioneers,' a young Communist group, and the other is the elevation of the productivity of the *logoped* in both cultural and political levels. In the main, however, the organization of the clinics, the use of reports, the cooperation with parents, the classroom integration, and the consultation with other specialists are all similar to what is being done in the United States.

Papers

Several of the papers (*1*) were devoted to therapy used with stutterers. Children as young as two years are given direct speech lessons. The generally accepted method includes removing children from their homes for a three-month period. The stutterers go to a residential school which specializes in speech work. The temporary separation of the child from his family is an effort to create a favorable psycho-physical environment for his speech development. Although direct speech therapy is rather formal, with directions for training for fluency by repeating sentences, by memorizing sentences, by narration of picture stories, by questions and answers, by independent narration, and finally by conversation regarding every day affairs, constant emphasis is placed on pleasant and challenging experiences rather than on a training routine. The *logoped* must have a large variety of didactic and illustrative material and

is instructed to be friendly but firm and consistent.

To help the parents understand speech therapy, frequent conferences are held. In taking case histories, attention is directed toward the health of the parents and their material status, as well as to their mode of living. Note is taken of the speech of all persons connected with the child. A careful study is made of the child's behavior and character.

The suggestions offered for the materials and methods to be used with children are familiar ones. Developing listening, showing pictures, teaching rhythms, and reading stories are techniques used by all teachers. The Russians, however, have put an emphasis on group games which require a good bit of physical activity. Folk dances that include speech and singing are commonly used. Table games are frowned upon because they are considered too passive. Excursions to zoos, gardens, railroads, and other places of of interest are encouraged. In all the discussions of speech therapy for the various age groups, supervised recreation plays an important part.

One of the authors suggests that children who stutter are different from other children. He states that they are nervous and negative in attitude, lack will power, have a hard time concentrating, are slightly slow in development, are extremely emotional, and sometimes lack coordination. He emphasizes a good mental hygiene program and suggests that singing has a special meaning for stutterers because it trains their sense of rhythm and encourages them to breathe rhythmically. The songs chosen should meet certain requirements, such as simple melodies and interesting contents. Other authors again and again stress the value of singing in all speech correction work.

One paper advocated that stutterers first be taught short vowels, then long vowels, and then the development of good breathing habits by prolonging the vowels. Words and short phrases are to be taught next, followed by verses and stories. The author suggests that stutterers should speak correctly; therefore, grammar should be given some attention. From time to time, references are made to the speech apparatus and verses are recommended which contain many sounds requiring strong movements of the tongue and lips.

Correct pronunciation plays an important part in all the Russian speech correction work. It has been observed that when a child learns to pronounce a sound, he produces it correctly in a new word, but retains the faulty sound in a familiar word; therefore, all drill work should be done through a new vocabulary. It is only after a sound is firmly established that the previously known words are used.

The paper on voice problems prescribed a complete rest from speech for seven-to-10 days. The rest period is followed by breathing exercises: (1) the breath is taken in through the nose and expelled through the nose; (2) air is taken in through the nose, then after a pause exhaled through the mouth; and (3) the two methods are combined, and gradually the patient is trained to have a shorter inhalation and a longer exhalation period. Various exercises for the speech tools are given, and articulation drills on [p], [t], [k], [u], [z], [f], [s] and [ʃ] are followed by work on the vowels. Lessons are devoted to reading, speaking and singing. Effort is made to develop length and strength of the voice

height of pitch, timbre and flexibility. In conclusion, the reader is admonished to remember that there is usually a medical problem with a voice problem. It is noted, also, that speech problems often accompany voice problems; consequently, there is need for speech correction. Finally, this wise comment appears, 'Voice teachers should be good.'

Observations

Viewed as a whole, the Russian speech correction program closely resembles our own. Trained *logopeds* are employed to work with speech defectives in either the schools or the clinics. Teams consisting of doctors, dentists, psychoneurologists, psychiatrists, audiologists, social workers and regular teachers review puzzling cases and contribute to the planning and treatment. Case histories are made and running records are kept. There is a close relationship between the *logoped* and the parents. Many of the methods used are similar to those employed in this country. The progress made is evaluated periodically, and reports are sent to the administrators. We were impressed by the familiarity evidenced by the Russians with the materials published in America and also with the names and the work of our leaders.

However, there are some differences. Apparently the Russians begin speech work with much younger children than those we would take for any formalized drill. This is certainly true of primary stutterers. Then, too, a higher degree of perfection at a younger age is expected. Frequent mention was made of pronunciation and of grammar. Singing as a technique for improving various defects is recommended. The total recreation program of the child is the concern of the *logoped*. We were conscious of the fact that although the psychoneurologist was mentioned frequently, the word psychologist was never used. Our curiosity was piqued by the questions in the case records concerning membership in the 'Pioneers' and again by the evaluation of the teacher's social and political growth.

While the Russian author who found stutterers in many ways different from other children would have difficulty substantiating his findings in the research done in our country, most of the theories on child growth and development correspond to our own. The tendency found in the Russian literature toward a mechanistic approach to therapy appears to be offset by a wholehearted acceptance of modern educational principles.

Apparently there are very few mechanical devices such as hearing aids, speech amplifiers or speech recorders. When we asked about the use of instruments for the amplification of sound, the director said, 'I want to be frank with you, to be truthful, not to mislead you—we have none. But,' she hastened to add, 'in the next few years we will have all we need.'

Some interesting theories and techniques have been developed in the teaching of speech to the deaf. It is believed that oral work has been attempted with children when they were too young. A child should be thinking words before he tries speech. A manual alphabet involving one hand is used. With his fingers beside his mouth and the printed word before him, the seven-year-old child learns simultaneously to read, spell, and speak. After speech is fairly well established, the hand is no longer used. The director reported that the children who had been taught by this method had much greater vocabularies

and better speech by age 10 than the children who had been given oral work since preschool days.

After much questioning concerning the extent of the speech services throughout the country, we finally were told that not all areas were as well served as Moscow, but this was the plan toward which they were working. The educators with whom we visited were courteous and cordial, and were as interested in our program as we were in theirs. They expressed the hope that someday it would be possible for them to visit our country. The greatest significance of the papers was the healthy positive attitude toward, and the genuine interest in, the child who needs speech correction. The motivation of the child is regarded as very important. 'Challenging material,' 'pleasant atmosphere,' and 'friendly and encouraging relationships' are typical of the phrases frequently used. All in all, the Russians show a positive approach to speech problems which is excellent.

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Application Of Operant Conditioning To Reinstate Verbal Behavior In Psychotics

Wayne Isaacs

James Thomas

Israel Goldiamond

In operant conditioning, behavior is controlled by explicitly arranging the consequences of the response, the explicit consequence being termed reinforcement. For example, a lever-press by a rat activates a mechanism which releases food. If the rat has been deprived of food, lever-pressing responses will increase in frequency. If this relationship between food and response holds only when a light is on, the organism may discriminate between light on and light off, that is, there will be no lever-pressing responses when the light is turned off, but turning it on will occasion such responses. From this simple case, extensions can be made to more complicated cases which may involve control of schedules of reinforcement. These procedures have recently been extended to the study of psychopharmacology (*5*), controlled production of stomach ulcers (*4*), obtaining psychophysical curves from pigeons (*3*), conditioning cooperative behavior in children (*2*), programming machines which teach academic subjects (*11*), analyzing the effects of noise on human behavior (*1*), and decreasing stuttering (7), to mention a few examples.

The following account is a preliminary report of the use of operant conditioning to reinstate verbal behavior in two hospitalized mute psychotics. Patient A, classified as a catatonic schizophrenic, 40, became completely mute almost immediately upon commitment 19 years ago. He was recorded as withdrawn and exhibiting little psychomotor activity. Patient B, classified as schizophrenic, mixed type, with catatonic features predominating, was 43, and was committed after a psychotic break in 1942, when he was combative. He completely stopped verbalizing 14 years ago. Each *S* was handled by a different *E* (experimenter). The *E*'s were ignorant of each other's activities until pressed to report their cases. This study covers the period prior to such report.

Wayne Isaacs (M.S., Southern Illinois University, 1951) is Assistant Clinical Director of Anna State Hospital, Anna, Illinois. James Thomas (M.A., University of Texas, 1953) was a clinical psychologist at the hospital during this experiment and is currently at Central State Hospital, Indianapolis. Israel Goldiamond (Ph.D., The University of Chicago, 1955) is Associate Professor of Psychology at Southern Illinois University and is Director of the Perception and Conditioning Laboratory. This report stems from projects connected with a weekly seminar on operant conditioning conducted at the hospital by the third author. Responsibility for the authorship and the *post hoc* analysis is the third author's; the first two authors are responsible for application of experimentally based procedures to shape the verbal behaviors of the patients.

Case Histories

Patient A —

The *S* was brought to a group therapy session with other chronic schizophrenics (who were verbal), but he sat in the position in which he was placed and continued the withdrawal behaviors which characterized him. He remained impassive and stared ahead even when cigarettes, which other members accepted, were offered to him and were waved before his face. At one session, when *E* removed cigarettes from his pocket, a package of chewing gum accidentally fell out. The *S*'s eyes moved toward the gum and then returned to their usual position. This response was chosen by *E* as one with which he would start to work, using the method of successive approximation (*9*). (This method finds use where *E* desires to produce responses which are not present in the current repertoire of the organism and which are considerably removed from those which are available. The *E* then attempts to 'shape' the available behaviors into the desired form, capitalizing upon both the variability and regularity of successive behaviors. The shaping process involves the reinforcement of those parts of a selected response which are successively in the desired direction and the nonreinforcement of those which are not. For example, a pigeon may be initially reinforced when it moves its head. When this movement occurs regularly, only an upward movement may be reinforced, with downward movement not reinforced. The pigeon may now stretch its neck, with this movement reinforced. Eventually the pigeon may be trained to peck at a disc which was initially high above its head and at which it would normally never peck. In the case of the psychotic under discussion, the succession was eye movement, which brought into play occasional facial movements, including those of the mouth, lip movements, vocalizations, word utterance, and finally, verbal behavior.)

The *S* met individually with *E* three times a week. Group sessions also continued. The following sequence of procedures was introduced in the private sessions. Although the weeks are numbered consecutively, they did not follow at regular intervals since other duties kept *E* from seeing *S* every week.

Weeks 1, 2. A stick of gum was held before *S*'s face, and *E* waited until *S*'s eyes moved toward it. When this response occurred, *E* as a consequence gave him the gum. By the end of the second week, response probability in the presence of the gum was increased to such an extent that *S*'s eyes moved toward the gum as soon as it was held up.

Weeks 3, 4. The *E* now held the gum before *S*, waiting until he noticed movement in *S*'s lips before giving it to him. Toward the end of the first session of the third week, a lip movement spontaneously occurred, which *E* promptly reinforced. By the end of this week, both lip movement and eye movement occurred when the gum was held up. The *E* then withheld giving *S* the gum until *S* spontaneously made a vocalization, at which time *E* gave *S* the gum. By the end of this week, holding up the gum readily occasioned eye movement toward it, lip movement, and a vocalization resembling a croak.

Weeks 5, 6. The *E* held up the gum, and said, 'Say *gum, gum,*' repeating these words each time *S* vocalized. Giving *S* the gum was made contingent upon vocalizations increasingly approximating *gum*. At the sixth session (at the end of Week 6), when *E* said, 'Say *gum, gum,*' *S* suddenly said, 'Gum, please.' This response was accompanied by reinstatement of other responses of this class, that is, *S* answered questions regarding his name and age.

Thereafter, he responded to questions by *E* both in individual sessions and in group sessions, but answered no one else. Responses to the discriminative stimuli of the room generalized to *E* on the ward; he greeted *E* on two occasions in the group room. He read from signs in *E*'s office upon request by *E*.

Since the response now seemed to be under the strong stimulus control of *E, the person*, attempt was made to generalize the stimulus to other people. Accordingly, a nurse was brought into the private room; *S* smiled at her. After a month, he began answering her questions. Later, when he brought his coat to a volunteer worker on the ward, she interpreted the gesture as a desire to go outdoors and conducted him there. Upon informing *E* of the incident, she was instructed to obey *S* only as a consequence of explicit verbal requests by him. The *S* thereafter vocalized request-

These instructions have now been given to other hospital personnel, and *S* regularly initiates verbal requests when nonverbal requests have no reinforcing consequences. Upon being taken to the commissary, he said, 'Ping pong,' to the volunteer worker and played a game with her. Other patients, visitors, and members of hospital-society-at-large continue, however, to interpret nonverbal requests and to reinforce them by obeying *S*.

Patient B —

This patient, with a combative history prior to mutism, habitually lay on a bench in the day room in the same position, rising only for meals and for bed. Weekly visits were begun by *E* and an attendant. During these visits, *E* urged *S* to attend group therapy sessions which were being held elsewhere in the hospital. The *E* offered *S* chewing gum. This was not accepted during the first two visits, but was accepted on the third visit and thereafter. On the sixth visit, *E* made receipt of the gum contingent upon *S*'s going to the group room and so informed *S*. The *S* then altered his posture to look at *E* and accompanied him to the group room, where he seated himself in a chair and was given the gum. Thereafter, he came to this room when the attendants called for him.

Group Sessions 1-4. Gum reinforcement was provided for coming to the first two weekly sessions, but starting with the third, it was made contingent upon *S*'s participation in the announced group activity. The group (whose other members were verbal) was arranged in a semicircle. The *E* announced that each *S* would, when his turn came, give the name of an animal. The *E* immediately provided gum to each *S* who did so. The *S* did not respond and skipped his turn three times around. The same response occurred during the fourth session.

Group Session 5. The activity announced was drawing a person; *E* provided paper and colored chalk and visited each *S* in turn to examine the paper. The *S* had drawn a stick figure and was reinforced with gum. Two of the other patients, spontaneously and without prior prompting by *E*, asked to see the drawing and complimented *S*. Attendants reported that on the following day, *S*, when introduced to two ward visitors, smiled and said, 'I'm glad to see you.' The incident was followed by no particular explicit consequences.

Group Session 6. The announced activity was to give the name of a city or town in Illinois. The *S*, in his turn, said, 'Chicago.' He was reinforced by *E*, who gave him chewing gum, and again two members of the group congratulated him for responding. Thereafter, he responded whenever his turn came.

After the tenth session in the group, gum reinforcement was discontinued. The *S* has continued to respond vocally in the situations in which he was reinforced by *E* but not in others. He never initiates conversations, but he will answer various direct questions in the *group sessions*. He will not, however, respond vocally to questions asked *on the ward*, even when put by *E*.

Discussion

Both *S*'s came from special therapy wards of patients selected because of depressed verbal behavior and long stay in the hospital; tranquilizing drugs were not used. The extent to which reinstatement of verbal behavior was related to the special treatment offered the patients in the special wards set up for them cannot readily be assayed. Among the special treatments accorded them were group therapy sessions. Nevertheless, the similarities between the pattern of reacquisition of verbal behavior by the patients and the patterns of learning encountered in laboratory studies suggest that the conditioning procedures themselves were involved in the reinstatement of verbal behavior.

In the case of Patient A, the speaking response itself was gradually shaped. The anatomical relation between the muscles of chewing and speaking probably had some part in *E*'s effectiveness. When a word was finally produced, the response was reinstated along with other response members of its class, which had not been reinforced. The economy of this

process is apparent, since it eliminates the necessity of getting *S* to produce *every* desired response in order to increase his repertoire. In this case, *E* concentrated on one verbal response, and in reinstating it, reinstated verbal responses in general. On the stimulus side, when the response came under the stimulus control of *E*, the stimulus could be generalized to other members of *E*'s class of discriminative *stimuli*, namely, people. This may have relevance for the clinical inference of the importance for future interpersonal relations of prior identification with some person. In the case of Patient B, the stimulus control involved a *given setting*, the rooms where he had been reinforced. The discrimination of *E* in one case, and not in the other, may be explained in terms of the establishment of operant discrimination, which also involves extinction (*9*). Operant discrimination is established when a response in the presence of S^D, a discriminative stimulus, is reinforced, and a response in the presence of S^Δ, a stimulus other than S^D, is not. After some time, the response will occur when S^D is presented, but not when S^Δ is presented; the response discriminates S^D from S^Δ, it having been extinguished when S^Δ was presented. In the case of Patient A, *E* was with *S* on the ward, in the group room, and privately. Reinforcement occurred in all occasions. But *S* was on the ward (and other rooms) without *E*, and therefore without reinforcement for those responses which were occasioned by the ward and which only *E* reinforced. Hence, these responses would extinguish in the ward alone, but would continue in the presence of *E*, defining discrimination of *E* from other stimuli. In the case of Patient B, this process may have been delayed by the fact that *E* and the other patients reinforced only in a specific room. It will be recalled that attendants rather than *E* brought *S* to the group room.

Interestingly, in the group sessions, when Patient B emitted the responses which *E* reinforced, other psychotic patients also reinforced Patient B. They were thereby responding, on the occasion of *S*'s responses (discriminative stimuli for them), in the same way that *E* did. The term *identification*, used as a label here, shares some behavioral referents with the term as used in the preceding paragraph and might be explained behaviorally in terms of the *generalized reinforcer* (*10*). These behaviors by the patients are similar to behaviors reported in client-centered group sessions, where clients increase in reflective behaviors as counseling progresses, and in psychoanalytic group sessions, where patients increasingly make analytic interpretations of each other. Here, the patients are also behaving like the therapist. While this parallel lends itself to the facetious thought that operant group sessions may produce operant conditioners, it does suggest that psychotics are behaving, with regard to responses by the major source of reinforcement in the group, according to the same laws which govern such group behaviors of nonhospitalized *S*'s.

The various diagnostic labels applied to psychotics are based to a considerable extent upon differences between responses considered abnormal, for example, hallucinations, delusions of persecution, and the like. The therapeutic process is accordingly at times seen in terms of eliminating the abnormal behaviors or states. Experimental laboratory work indicates that it is often extremely difficult to *eliminate* behavior; extinction is extremely difficult where the schedule of reinforcement has been a vari-

able interval schedule (*6*), that is, reinforcement has been irregular, as it is in most of our behaviors. Such behaviors persist for considerable periods without reinforcement. Experimental laboratory work has provided us quite readily with procedures to *increase* responses. In the case of psychotics, this would suggest focusing attention on whatever *normal* behaviors *S* has; an appropriate operant, no matter how small or insignificant, even if it is confined to an eye movement, may possibly be raised to greater probability, and shaped to normal behavior (*8*). Stated otherwise, abnormal behaviors and normal behaviors can be viewed as reciprocally related, and psychotics as exhibiting considerable abnormal behavior, or little normal behavior. Normal behavior probability can be increased by decreasing probability of abnormal behaviors, or abnormal behaviors can be decreased by the controlled increase of normal behaviors. This preliminary report suggests that a plan of attack based upon the latter approach may be worth further investigation.

Summary

Verbal behavior was reinstated in two psychotics, classified as schizophrenics, who had been mute for 19 and 14 years. The procedures utilized involved application of operant conditioning. The relationship of such procedures, based on controlled laboratory investigations with men and animals, to procedures based on clinical practice with human patients was discussed and was considered as directing our attention to shaping and increasing the probability of what normal behaviors the psychotic possesses.

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Determinants Of Motivation In Speech Therapy

Jane Beasley Raph

Speech therapists are highly desirous of bringing about change in the speech of children and young people with whom they work. They hope, in turn, that their students will be equally desirous of such change, in which case results can often be gratifying to all concerned. However, this ideal matching of aspiration often fails to occur. As a consequence, the person with defective speech who is not progressing is then described by the therapist as one who 'could if he would' or one who 'just doesn't seem to be motivated.' Such a judgment is followed by a search for some technique, device or material which can be employed in order to obtain different behavior or improved learning. If the learner's inertia is accordingly converted into his making more effort toward the desired goal, motivation is then assumed to have been accomplished. This places the burden of achievement largely on the shoulders of the therapist.

Such a concept of motivation is, in its best sense, of critical importance for understanding the learning process better. However, unless certain other features are taken into account, such a view suggests a kind of puppetry wherein an operator pulls strings to obtain the results he wants. The teacher has to locate some direct approach which will cause the pupil to pay better attention, work harder, and practice more. Or the teacher has the job of designing more devious ways of accomplishing a similar purpose through games, contests, or elaborately structured experiences insuring a kind of painless and effortless learning on the part of the child.

It is the purpose of this paper to shift the focus from a teacher-centered orientation of motivation to a consideration of certain values and attitudes present in a child's motivation for learning. This concept will be developed by referral to some current research in motivation followed by a discussion of its implications for the practice of speech therapy.

The values and attitudes which a child brings to the learning situation are seen by theorists in psychodynamics to be learned by the child in the first years of life and to be largely unresponsive to manipulation or change by formal instruction. For example, early learnings can oftentimes be recognized in a child with delayed speech who has found it safer not to talk in response to the demands and criticisms of his parents and who cannot voluntarily begin to speak as a result of urging by a speech therapist until he learns the therapist is different from his parents and can be trusted. Less easy to recognize, perhaps, but also discernible, are the in-

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dications of previous learnings in the case of a third grader who substitutes [w] for [r] and [l] and who, although he can produce the sounds correctly, does not incorporate them in his speech. Only as this child's possible need to retain a dependent hold on adults is understood can his apparent lack of progress be explained, at least in part. This child can certainly be said to be strongly motivated but not by any goal of maturity in speech at this point. In brief, it can be said that any child receiving help on his speech has already learned certain defenses against the external world, parental expectations, sibling difficulties, and the doubt and guilt he has about himself. These experiences may restrict his capacity to change regardless of exposure to the best teaching methods and the warmest encouragement.

Related Studies

Investigations of human motivation have identified and studied certain nonacademic determinants of achievement, determinants other than ability level, voluntary acts, and cognitively guided skills which seem to account for the consistent behavior of a person regardless of the situation. McClelland (*4*, *5*, *6*, 7) has developed a method for assessment of the achievement motive through analysis of imaginative thought. By use of now standardized procedures, persons with high achievement drive can be differentiated from those of low achievement drive by presenting them with a series of pictures and certain directions for writing about the picture. Under test conditions set up to induce achievement tension, those with high achievement drive tend to produce stories in which more characters are described as wanting to get ahead, doing something useful about getting ahead, and thinking in advance about success and failure than do the characters in the stories of the persons with low achievement drive. Aronson (*1*), in turn, has developed a method for scoring the achievement motive at an early age by scoring for it from expressive doodles or scribbles made by children.

Related studies have dealt with some of the possible origins of achievement motives, four of which will be described below. One deals with the effects of early independence training on achievement drive, a second with the influences of power structure within a family on achievement, and the third and fourth with the effects of controlled hostility and aggression on school performance.

Winterbottom (*8*) compared the child rearing practices of mothers of a group of eight-year-olds designated as having strong achievement drive with mothers of eight-year-old boys designated as having weak achievement drive. The mothers of children with strong achievement motivation differed in that they (1) made more demands on their children before the age of eight; (2) evaluated their children's accomplishments higher and were more rewarding; (3) made more restrictions on their children before the age of seven, but fewer restrictions after age seven; and (4) made a greater number of demands than restrictions before age seven. The investigator concluded that while her findings showed the complexity of the determinants of the drive to achieve and the need for much more experimental evidence, they also indicated the importance of the mother's influence on the child's achievement of independence and mastery.

Strodtbeck (*6*) investigated the effects of the interpersonal relation-

ships within families based on decision-making power and participation between parents and with the son on the achievement-related attitudes of high school boys. He obtained evidence that the power position of the father was critical, that is, boys with dominant fathers tended to be submissive, have low achievement values, maintain a belief in destiny beyond their control and show unwillingness to leave home. On the other hand, if the mother's power were stronger as reflected in the fact that she won relatively more decisions, then the son was likely to have higher achievement values.

Both Kimball (*2*) and Kirk (*3*) in studying academic underachievement found that poor father-son relationships resulted in considerable underlying aggression, few outlets for feelings, and consequent guilt and anxiety. These researchers hypothesized in separate studies on the basis of their findings that resistance and repression were directed toward strong efforts to control such hostility and acted as deterrents or immobilizing influences on school performance.

Implications

A speech therapist may well question the relationship between such research findings and clinical practice. It is true that an integrative method for measuring motivational variables is still lacking as is a clear-cut method for investigating origins of such variables. Nevertheless, certain basic premises of the experimental work in progress do show promise, in the writer's opinion, for explaining some of the factors operative in a child's response to speech therapy. To view the child's drive toward attainment of a certain purpose as partially nonvolitional in nature and partially hidden from the searchlight of consciousness, his own and others, places an obligation on the clinical worker in speech to understand as much as possible about the child's situation rather than to blame the student or teacher for lack of improvement. An illustration may help to clarify this concept.

A group of preadolescents enrolled in a full-time program of speech therapy with a number of teachers were asked to write as rapidly as they could as many ideas as they could think of pertaining to their work in speech, anything at all that came to their mind. A representative sample contained the following items: 'Work hard. Do your best. Say it again this way. Do your home work good. Open your mouth bigger. Take your time. Don't work so hard. Practice for about 10 minutes. Think before you speak. Say it again. Do it over again. Now again. Watch your speech. Go more slowly. Have that done by tomorrow. Don't stop. Practice. Practice. Practice.' Many inferences can be drawn from these statements. Particularly relevant to this discussion is the apparent evidence that the therapists in this setting saw results as dictated largely by repetition and conscious control. If the student improved, the change could be attributed to effort, while lack of improvement could be explained by a failure of effort. In either instance the explanation would be somewhat superficial and inadequate on the basis of what is presently conceptualized regarding motivation.

More relevant an explanation of the therapeutic situation would be an attempt to account for the child's effort or lack of it. What can easily be regarded as a child's determination to improve his speech may actually represent a need for approval to enhance

his sense of worth, or a drive for mastery, or a pattern of affiliating with an authority figure as a means of maintaining security. While such behavior and the resulting improvement in speech can be rewarding to the speech therapist, care must be taken that the child has opportunity to develop a sense of esteem for himself not entirely rooted in the opinions of others, that he can accept his own shortcomings part of the time, and that he can function as an individual in his own right, not just as the appendage of a superior.

In contrast, a child's failure to change his speech may have little to do with wanting to talk better or not, but may be a reflection of a basic motivational pattern. This pattern he may have learned well as a means of coping with parental restrictions against exploration or initiative, for example. Or he may unconsciously fear expressing feelings of hostility which place a heavy burden of constriction on any oral expression. Resistance to change can often be a child's way of grasping at a thin thread of interest or support from the therapist which might be denied him if his speech became adequate. At a more symbolic level, the oral attention he receives from the speech therapist may be, to him, nourishment or punishment which had been necessary to him, or denied to him as an infant. Such inferences can, of course, be only conjecture, conjecture rooted in theory and supported by that dubious assistant, clinical judgment. However, the fact of unknowns and complexities in the organism's struggle to achieve integration remains, a struggle peculiar to each individual, not a single acceptable pattern passed on by outsiders. The speech therapist has a choice of disregarding the presence of multiple determinants of behavior which influence the speech process or of viewing speech in relation to the person's total drive to achieve satisfaction and security.

The latter task requires the therapist to have some background in developmental psychology, some sensitivity to the nuances of the therapeutic relationship, and a willingness to learn as much as possible about an individual child's emotional functioning. Obviously, a speech therapist cannot do a case study on each child with whom he works, but he can often gain sufficient information from a conference with a child's teacher and parent to confirm some of his own observations. In some instances he can also avail himself of the services of the school psychologist or social worker, or of a child guidance clinic. His awareness of the presence of feelings on the part of the child may be as important as any information he gathers, awareness that the child does not automatically want to talk better, or if he does, that the process is not a simple matter of volitional control. Once the therapist's point of view shifts from seeking an explanation for what occurs in speech class in the teaching method alone, or in the stereotype of the cooperative or non-cooperative pupils, and considers the presence of motivational determinants within all children, he will discover productive possibilities for a better understanding of human behavior and for facilitating the teaching-learning process.

Summary

In summary, this paper has suggested a consideration of values and attitudes present in a child's motivational system which influence learning, has described some current research findings in the area of motiva-

tion, and has suggested some implications of this research for speech therapy.

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Communication In The Therapy Session: A Point Of View

Elise Hahn

The speech therapy session needs re-examination. Years ago, when training in speech involved memorization of pieces or presentation of formal debates, methods of correcting articulation centered around the repetition of word lists or of tongue-twisting jingles. In the attempt to make this practice more palatable to children, a change occurred: the drill was sugar-coated by the use of games, and the foolish jingles evolved into 'cute' poems intended to please children. The slogan became 'Speech correction must be fun.'

Without losing the benefits of this pleasurable participation, the therapy session can frequently be planned around more realistic procedures than spinner games and holiday commemoration. The speech we wish to improve is communicative speech: the speech that expresses ideas, reveals feelings, and produces an effect on the listener. The socialized aspects of speech therapy have been stressed before; this is not a new approach but a plea for those in public school speech therapy and in university training centers to look again at their therapy sessions.

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What is the therapy session? It is not a place where 'we learn to make *L's* this week.' It is not a time when a child repeats what his teacher tells him in order to win a game. From one point of view, it is a situation (1) in which the individual desires to communicate his ideas and feelings, (2) in which he is led to discover that there are better ways of communicating than those he now uses, (3) in which he is shown how to speak more effectively, and (4) in which he makes use of the new improved way of speaking in actual self-motivated communication. Each session then includes some genuine communication as the context which motivates the speech act, it shows need for change, and it provides the opportunity to make use of the change in meaningful speech.

Part-Process Approach

Too often, by their actions, therapists indicate that the main goal in attending the speech correction class is to change small part processes, not to improve the children's way of expressing their own ideas. Because the therapist says so, [t] must be changed into [k], [w] into [r], *etc.* 'This is the week when we practice *th* in game, flannel board and rhythm.' To replace an old act with a new, we have been told that the new act must be repeated over and over. But in this part-process approach, the new act

does not seem to be the act of communicating. What is repeated is a fragment of the whole, placed in a meaningless context.

It is true that an adult who realizes the need to improve his speech can concentrate on one aspect of his communication and drill himself profitably on single sounds and words. The mature individual may be following these steps in self-correction: (1) he accepts the fact and discovers the nature of his defect, (2) he desires to improve, (3) he is able to extract the part from the whole even while realizing its relationship to the whole, (4) he understands the reason for drill, and (5) he can listen critically to himself during the speech act.

We have frequently assumed that children respond to therapy in the same way. The therapist, on meeting the child, sees that a part process can be changed: a [k] for a [t] or an improved [s] for a protrusion lisp. He starts work by (Step 1) telling the child that he has a defective sound and that he will show him how to make a 'good' one; (Step 2) wanting the child to change; (Step 3) extracting the part from its normal whole and creating an artificial whole, such as a game or poem; (Step 4) providing attractive drill to win games or teacher approval; and (Step 5) urging the child to listen for and remember to use the new sound in his class and at home. These five steps *might* bring about correction with a mature person. Their validity must be questioned in work with a child.

Examine this system in action.

'Children, we are going to work on the [k] sound today. Listen to me as I make it: [k]-[k]-[k]-[k]. Now tell me if this is right: [t]-[t]-[t]-[t]. Can you see and hear the difference?' (A brief explanation follows.)

'This is our bottle sound. Put your fingers here under your chin and feel the jump when you say [k]-[k]-[k]-[k].' (This is Step 1, showing the children how to make the good and bad sound, identifying the sound and producing it frequently. The children are interested.)

'Now, children, here is the game. You have used the spinner before. When it's your turn, spin the spinner and say, "Keep on, keep on, till my number comes." Do you hear the new sound? When you get a number, you can turn over the picture which has your number on its back. If you remember to use the new sound when you say the picture's name, I'll give you one of these red markers. Whoever gets the most, wins. Yes, Tom, that is right—"car." Did you hear how well he said it? Say [k] again, then "car," and "I have a car." ' (These are Steps 2, 3 and 4. The therapist has shown by his manner that he wants the child to change, he has extracted the part for examination, and he has provided drill of the new part process and imposed a teacher-initiated phrase. Incidental talk is kept at a minimum.)

When the child is about to leave, the therapist says, 'Don't forget to listen for the [k] sound all week and bring me a picture with that sound in it.' (Step 5 is complete: the therapist is attempting to make the transfer to use in real life.)

In the next session, the therapist reads a story about a talking teakettle. Periodically in his adventures, Mr. Teakettle says, 'S-s-s-s.' The children help him each time and thus receive the muscular experience of producing [s]. They end the period with an activity in which they can each peek in a little window of a cardboard house and name the [s]-picture which they see there. The interest is high in winning the game, hearing the narrative, satisfying their curiosity about

the house, but not in using the improved speech to express self-initiated ideas.

In these common procedures, the therapist holds the motivation to change the articulation and understands the social reason for the improvement; the child does not. The therapist perceives that a part has been extracted from the whole; the child does not. The therapist can teach him the single sounds and words; but when the child starts to communicate, 'Bob tame to my house,' 'I need the thaw,' he may not hear the part process in the larger communicative context. From a phonetic standpoint, the child may have been taught to say 'car,' but he has not been shown how to make the transition from many sounds into [k], as in 'My red car,' 'The only car,' 'I want a car.' Nor has he been taught to talk about 'car' in a purposeful communicative way, with genuine feeling, so that he can say with meaning as well as clarity, 'I like this car best,' 'Don't take my car.' At the end of the session, in urging the child to remember the new sound during the week, the therapist has asked him to do something which even the adult finds difficult: to attend both to what he is saying and to a part process bound up in his communication.

To make this unrealistic approach palatable to children, speech therapy is now too often lost in 'game land,' where single sounds and words or teacher-dictated lines constitute language. In spite of such criticism, however, it is evident that some children do improve under the noncommunicative, part-process approach. If a particular child needs approval greatly, desires love from an adult and feels that the therapist is loving and lovable, he will imitate the therapist's speech because of his emotional needs. In this comfortable situation, he will communicate spontaneously and receive some correction as he talks. The teacher produces good results, not on the basis of what he does but of what he is.

The pleasant teacher's success gives us some clues as to what is valuable enough to retain in the therapy session. The close and comfortable relationship as well as the motivated spontaneous communication are key factors. The therapeutic process with young children relies greatly upon imitation. A strong bond must exist between therapist and child since no one imitates spontaneously unless he is interested in, and identifies with, his model. But, if the teaching relies strongly on imitation, the young child must be given genuine language to imitate or hear his own phrases said correctly, not single words or phrases that he will not use in social exchange.

Communicative Phrases

What constitutes genuine language in the therapy session? The phrase is our unit of expression. Besides being a unit of meaning, it has physical unity since the speech mechanism moves continually during the phrase, blending the sounds without a break. It also has strong rhythm and is inflected meaningfully. Occasionally a single word constitutes a unit, as when a child answers, 'Big,' in reply to your question whether his brother is little or big. If you ask, 'How are you?' the reply is 'Fine.' The single word becomes the unit. If you ask, 'Where is your book?' the verbal answer is not 'Table,' plus the hand gesture, but 'On the table.' The phrase is sometimes a complete sentence, as in 'I like the blue car.' The demand that a child reply in complete sentences is unrealistic and discourages conversation.

The following therapy session

shows how the purposeful phrase that the child uses or can use is the corrective medium. The therapist and four small children have been making up a story around miniature toys and figures. The therapist asks, 'And where is the kitty hiding now, Tom?' With a hesitant child, some therapists might point to the car and say, 'Car,' and ask for much repetition. But the unit of communication is not 'car,' because that would necessitate an accompanying gesture to complete the meaning. The unit is 'in the car.' One does not require with dreary insistence that the child say, 'The kitty is in the car.'

If the child can be guided into replying, 'In the car,' or more likely, 'In the tar,' the therapist can separate the part from the whole. 'Let's try the sound that needs changing. (He demonstrates, showing placement, allowing the children to look and listen carefully.) Now when we use that word in our own stories, we'll know how to say it just right so that everyone can understand us.'

The child's phrase is a purposeful response, similar to what the child will say on other occasions. It maintains the rhythm of oral expression, it can be meaningfully inflected, it establishes not just phonetic placement of a single sound but movement toward and away from the sound necessary in all future use of [k]. Since it represents the child's own communication, it provides the inherent reason for improvement: to be understood. The therapist's voice in reply indicates that he is most interested in this communication. He repeats the phrase as he returns it to the story. 'That's where the kitty is hiding, *in the car*. Now what happens next to the kitty, Helen?'

In the upper grades, one does not rely so strongly on imitation, but the principle of using communicative phrases still holds true. For example, the therapist and three pupils with pronounced articulation problems are examining pictures in a book on prehistoric animals which supplements work in the classroom. The therapist asks, 'Where did they find the bones of these animals?' The answer follows, suggested by the picture, 'In the sand pit.' The [s]-word is in prominent position, just as the [k]-word was emphasized in 'In the car.' The students are now asked for an examination of the way [s] is produced, for trial and error practice of tongue placement of the single sound and word. In final repetition, the sound is incorporated in the boy's own response, 'In the sand pit.' The students then move back into the regular context of the discussion of the animals. Is this not better teaching than asking the boys to find the [s]-words in the pictures of animals?

The use of the meaningful and often spontaneous phrase as the corrective medium can become automatic. Because of past training, the therapist has a good ear and a fine phonetic background on which to rely in order to show the child how to move the articulatory mechanism for such variations as 'under the sand,' 'more sand on top,' or 'deep in sand.' One learns to spot the sound as it occurs in context or to bring the particular phrase out by questioning. The therapist learns also to maintain the communicative tone, the expressive inflection and rhythm of true speech as he repeats the phrase for study. He avoids the meaningless staccato beat and the mouthing of sounds. He builds the student's interest in communicating because he has placed value on the student's reply. How uninteresting it becomes when the teacher says, 'The bones are buried in the sand.

Where are they buried? Let's hear you say, "In the sand." '

Contrast such procedures with the Airplane Lotto game, in which boys cannot make their plays unless they name the pictures correctly. They receive practice on the single names of planes, but the words are corrected in response to the rules of the game. The response has no emotional meaning, no expressive change in voice or gesture, no phonetic practice in moving toward and away from the sound. If the boys chatter on the side, they are urged to be polite; the true exchange of ideas is not used for corrective practice.

Materials

This practical question now arises: If the therapy session should stimulate the desire to communicate in order to place the correction in a meaningful context, how is the conversation started? Whatever activity suggests comments, questions, explanation or reporting of past events is useful. Puzzles, coloring, most games, and questions that elicit one-word answers are not conducive to talk. Strange materials can sometimes be useful.

On a stormy day, dozens of sow bugs sought refuge in the clinic room. Two six-year-old boys and the therapist discovered these little hard-shelled bugs that roll into a ball when touched. The therapist started a running comment to verbalize what was happening. 'Look, these are sow bugs. This one's mine. Touch one. See how he curls up? Little sow bugs. Get your own piece of paper and put it down for them to climb on.' Then he talked to the sow bugs. 'Get on, sow bugs, get on the paper.'

The suggestion was too strong to resist. One child talked to the bugs too. 'Det on, tow buds.' Without pausing in the activity, the therapist announced that even bugs liked to have their names said rightly. Therapist and boys stopped a moment to practice 'sow bugs,' and 'get on.' Then they all talked persuasively to the bugs again. 'My bug is bigger than yours,' announced the therapist. 'No, mine is bidder.' 'Big-big-bigger.' No inducement for practice was needed. 'Guess where mine is.' 'I dess under your hand.' 'Let's practice "I guess" and then I'll lift up my hand to see if you are right.'

By using phrases and short sentences which reinforced action, the therapist had made the verbal response an integral part of the interesting action. Saying the phrase correctly became an accepted part of the communicative exchange and the short drills therefore seemed meaningful to the children.

The very young child first learns structured speech in relation to a going activity in which he is highly engrossed. If he says names, they are primarily one-word sentences, made complete by inflection and gesture. If the therapist participates with evident pleasure in the child's activity, he can verbalize his actions in simple, direct phrases. When he pauses, the child tends to pick up these phrases to maintain his action. When the child makes a comment, this is the correction medium.

One does not have to collect bugs. Stones to make a corral for miniature horses, blocks for a fort, clay to make snakes or lizards, a wagon to fill—all of these require language to structure action. Each child in the small group can take his turn making suggestions or comments. The materials suggest things to do. The horses escape the corral and are captured. The pioneers and Indians must confer before they kill each other off. The farmers must load the wagon for market. If two

figures talk to each other, they should talk clearly enough to be understood.

When the children are somewhat older and the language more complex, they and the therapist can play store. A storekeeper has to repeat the names and prices of his merchandise clearly, just as a gas station man or a waiter must be understood.

For grades beyond the primary, the therapist should find out what is going on in the social studies period in the regular classroom. Discussing and enacting how the Pilgrims landed, with doll figures or puppets, or with the aid of Pilgrim hats, can provide the context for purposeful talking which will in turn provide the phrases for practice material. Out of social studies can develop reporting, explanation, reading aloud, argument and discussion as well as creative dramatics. Making family trips can lead to talk on trips in general; a school safety program can be dramatized or reported. For the older child, therefore, the therapy session can be derived from classroom and school activities, from home and family experience, or from observed action of men in the community. In each situation, the therapist uses the total language approach. Each time he calls attention to how a phrase is spoken, he teaches articulation, expressive use of voice, and sometimes gesture, grammatical structure and vocabulary.

When the therapist plans his sessions, he will no longer follow this line of reasoning: This week we work on [k]. It's Thanksgiving, so I will get out the turkey and the pumpkins and we'll practice, 'Pumpkin, pumpkin, sitting on the wall, one old pumpkin is about to fall.' Miraculously, after it falls, we find a picture on the other side whose name starts with [k]. When we have gone through all the pumpkins, we can say a Thanksgiving poem and the session will be over.

Instead, the therapist thinks: How can I get these first graders interested in saying something about this little log cabin and ski figures? How can I indicate to each child that there is a better way of saying his idea? Can I select from each child's communication the words and sounds which he needs to improve, and can we then practice them before we put them back into the ideas the child wishes to communicate?

Or, with an older child, he thinks: How can I get this sixth grader to explain the fine points of kickball as if he were a gym instructor? How then can I keep his response under control so that he will examine particular aspects of it, discover how to improve them, practice and then place these improved parts back into his satisfying discussion?

This is creative teaching. Some will say that it is too difficult since the spontaneous comment is elusive. Some will say, before they try it, that it does not provide time for concentrated practice. In actuality, however, the practice is short, frequent and meaningful. Transfer of the new habit into conversation will no longer be a problem. Saying the phrases correctly will be bound up with the child's own purpose in communicating his ideas. The therapy goes beyond repetition of muscular actions, or saying it right because the teacher says so, with game winning and teacher praise the only sources of motivation.

Summary

This paper suggests a speech therapy session designed to (1) stimulate the desire to communicate, (2) help the child to discover the specific improvement needed, (3) show him the new way to make the sounds, and (4) place the corrected sound in the communication of his own ideas.

Concepts Of Stammering: A Century In Review

C. S. Bluemel

Stammering has long been an enigma. It has been the despair of the physician and the opportunity of the quack. At the turn of the century, the stammerer could buy a 'guaranteed cure' of his speech disorder for as little as 50 dollars. Today he can purchase a correspondence 'correction course' for a little less than 200 dollars. But the day of the commercial therapist is nearly gone. The elocutionist, too, recedes from the picture. His work was ethical, but generally futile. His procedures consisted largely in respiratory, vocal and articulatory drills and they proved ineffective. There have been many approaches to the problem of stammering. The cure has been attempted by plastic surgery on the tongue, by mechanical devices worn in the mouth, and by time-beating machines used to 'regulate' the speech. There are many views concerning the cause and cure of the speech disorder, and there have been many illogical 'remedies.' This is not surprising, for the problem of stammering is exceedingly complex.

Early Concepts

Among the fallacies of the past is the belief that stammering is caused by spasm, and thus we have the classification of stammering in numerous categories—spasmus inspiratorius, spasmus expiratorius, spasmus labialis occludens, vox tremula, os quadratum, *etc.* One nineteenth century writer gives 21 classifications of stammering presumably caused by 'defective association' of the muscles of the respiratory and vocal organs with the speech organs. These 21 disturbances range from pneumo-gnathomania to pneumo-gnatho-glosso-cheilo-mania (*6*). The nineteenth century concept of spasm persists to the present day, and some modern writers identify stammering as spasmophemia, dysarthria syllabaris spasmodica, *etc.* Yet it is clear that spasm is not the cause of stammering; it is one of the physical components of secondary stammering. What appears to be spasm is in reality the stammerer's struggle to articulate when the mental speech is confused or muted by excitement or emotional shock.

There are many fallacies regarding the 'cause' of the speech disorder. Stammering is sometimes said to result from failure of the voice, refusal of the voice, delay in vocalizing, inability to vocalize, ineptitude in management of the voice, a lagging of the laryngeal mechanism, *etc.* Again we have symptoms proffered in lieu of cause. This is analogous to explaining hemorrhage by the presence of blood.

There are false leads in the theory of stammering which place the emphasis on respiration. We have already mentioned spasmus inspiratorius and

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spasmus expiratorius. Another commonly identified 'cause' of stammering is breath-holding. One writer says that 'respiratory disturbances are to be found in all stammerers.' With a little clinical insight we can see that the disturbances of breathing are merely part of the secondary stammering, part of the stammerer's futile struggle with his speech. However, a pattern of respiratory disturbance which is easily overlooked is the disturbance of rhythm that one sees in young children who are speech-halted by excitement. The altered rhythm is a component of the excitement, and it appears independently of any effort to talk.

As one reviews a century of the history of stammering, it is clear that the thinking in this field has produced many misconceptions. One of the significant fallacies of the nineteenth century was the belief that stammering is caused by a low position of the tongue in the mouth. This strange theory dominated clinical thinking for a number of decades, and it prompted the German surgeon, Dieffenbach, to operate on the tongue to bring it nearer to the palate. A less drastic remedy consisted in the use of mechanical devices to raise the position of the tongue. In the history of this period we encounter Itard's 'tongue fork,' Colombat's 'refoule langue,' and Wutzer's 'glosso-mochlion.' The period also gave rise to the Broster-Leigh-Yates-Malbouche-Hagerman 'method,' which was commonly sold as a secret. The method required the stammerer to keep the tip of the tongue constantly in contact with the roof of the mouth. There were variants of the method, but their common purpose was to raise the tongue from its supposedly low position (*1*).

Modern Concepts

Among modern concepts we have the dominant gradient theory, the belief that cerebral dominance is disturbed when a left-handed child is required by his parents or teachers to use the right hand. Theoretically, the change of handedness disturbs the functional balance between the two halves of the brain and induces stammering. The theory has more to support it than the low-tongue concept, for some investigators have found left-handedness and ambidexterity to be common among stammerers. In the biological view this probably means that the stammerer is poorly organized, not only in his speech function but also in his neuromuscular system. Clinically, the change of handedness has little effect on speech. When a boy breaks his arm, he must necessarily change his handedness, but the orthopedic surgeons find no incidence of stammering. A German investigator gathered data on 1200 one-armed people, but he found no stammering among them (*8*). Nevertheless, the theory of disturbed laterality persists, and because of the 'social lag,' one finds it cited today in a number of the current textbooks on pediatrics and psychology.

There are two points of validity in the handedness theory, and these must be mentioned in objective evaluation. First, there is frustration and stress in giving the unskilled hand the work which the skilled hand has done before. Interchanging the hands might conceivably be as uncomfortable as interchanging one's shoes. And again, the child who is changing his handedness under parental pressure is necessarily subjected to repeated correction. Here we have another form of stress. The emotional stress, together

with the physiological stress, might well disturb the function of speech.

The paucity of valid concepts in the field of speech disorders accounts for the many dubious beliefs and practices that appear from time to time. Some of them are so well-established and so ethically sponsored that it seems offensive to query them. Yet it can be seen, in the history of science, that acceptance and validity are sometimes unrelated. The practice of bleeding, or blood-letting, was accepted for over 500 years; and it was not effectively challenged till medicine came of age. The science of speech has not yet matured; hence we must evaluate even our modern procedures. Here the procedure of 'negative practice' comes into question.

Negative practice consists in doing voluntarily the things that you wish to avoid as a habit. The practice was recommended by Knight Dunlap about 20 years ago (*4*). If you wish to avoid an involuntary facial twitch, stand before a mirror and twitch the muscles consciously. Dunlap says that 'practice for 15 minutes a day for three weeks has been sufficient to cure tics of long standing.' He adds that 'applications to stammering are more tedious' and that the method 'is not applicable to children.'

Obviously the method of negative practice has severe limitations, and one has reason to doubt the validity of the underlying principle. It is not a principle broadly applicable to medical problems. It could not be used, for instance, in solving the problems of the homosexual or the alcoholic. It is of no avail to a man obsessed with compulsive handwashing, for more washing merely makes the fissures in the hands deeper. And apart from medical matters, it is doubtful whether a singer would improve his skills by singing out of tune.

In support of negative practice, however, it must be said that the practice sometimes works. It may work under the stimulation and moral support of a skilled and assuring therapist. This does not mean that the principle is sound but that the therapist himself is an effective therapeutic agent. Indeed, this is a basic principle of therapy in the confused field of functional speech disorders. Negative practice may work for a few skilled therapists, just as bleeding worked for a skilled surgeon like John Hunter. The ability to manipulate a procedure does not render the practice safe in unskilled hands, nor does it establish the soundness of the principle. The objection to negative practice is the fact that it is directed only to the phobic phase of secondary stammering; hence it is based on a narrow concept. Moreover, it is seldom possible to toughen a stammerer merely through the medium of voluntary stammering. A further objection to negative practice is the fact that it tends to distort the stammerer's inner speech even though the stammering is voluntarily performed.

We come now to the subject of rhythm, syllabic speaking, and time-beating. The practice has a historic background, for it seems that the use of rhythm in oratory can be traced back to ancient Greece and Rome. About a century and a half ago, Thelwell recommended 'the rhythmus of Milton' as a remedy for stammering (*10*). A few decades later the time-beating devices came into use—Serre d'Alais's *isochrone*, Combat's *muthonome*, and Maelzel's *metronome*. In America, the tick-tock machine eventually became a *word-regulater*, and it has scarcely disappeared from the commercial world of speech correc-

tion. Manual time-beating, in different patterns, has long been employed in the treatment of stammering, and the procedure is not fully relinquished. While rhythmic speech is a rather harmless remedy, it distorts the speech into so abnormal a pattern that few stammerers are willing to adopt it. Perhaps the chief stigma to rhythmic speech is that it has long been the secret remedy of quacks. It has probably been used more than any other method in the 'guaranteed cures' sold to stammerers.

It can be seen that many of the older concepts in the theory and therapy of stammering are little more than notions, and they do not withstand critical examination. This is likewise true of some of our newer procedures, for the science of speech correction is singularly barren in tested principles. This observation carries no reproach to the dedicated worker in the field of speech disorders, for the field is still in virgin undergrowth and it is difficult to penetrate it.

Fortunately we have some procedures of positive value. Relaxation, for instance, is more on the positive than on the negative side. The practice is well over a hundred years old (*5*), and in the hands of some speech correctionists it has constituted an entire system of therapy. There is no well-formulated theory to support the therapy, but the experience with relaxation has proved sufficiently satisfactory to make the practice empirically acceptable. Many stammerers are tense (hypertonic or hyperkinetic) and they speak more fluently when the neuromuscular tension is reduced. Yet in speech therapy it might be better to speak of tranquilization rather than relaxation. While relaxation is beneficial in the struggle-phase of secondary stammering, composure is helpful in any phase of speech. There is effective psychotherapy in the admonition 'Take it easy; sigh the words out,' *etc.*; but here, as in many situations, the significant component may be the therapist. A speech teacher who is calm himself can impart feelings of calm to others, but a therapist who lacks composure can scarcely bring feelings of tranquility to his pupils by telling them to relax.

Although the principles of relaxation have much to commend them, it can be seen that the practice has rather sharp limitations. The therapy may be effective in the classroom, but the attempt to command relaxation may fail in difficult speech situations. The stammerer cannot spontaneously relax at the telephone or at a ticket window, and he will often find his remedy ineffective when he needs it most. Then again, the therapy has little relation to the *cause* of stammering. It is directed to the effort-phase of secondary stammering, and it relates to the primary speech disturbance only to the degree that it establishes composure as a basis for quiet inward speech.

With the matter of composure in mind, we might consider the traditional belief that a child stutters because he is thinking faster than he can talk. Sometimes the matter is stated conversely, that the child is trying to talk faster than he can think. The concept has a good deal of validity if we consider the significance of *verbal* thinking. Much of the child's 'thinking' is really *feeling*, for his subjective life carries a large component of emotional reaction. Little Johnny rushes into the house to tell his mother that he has just seen a dog run over by a car or that he has seen an elderly gentleman have a convulsion on the sidewalk. Here the overwhelming conviction is what he feels, but he lacks the tranquility to translate his feel-

ings into words. With a little composure he might manage a statement about the dog, but to describe the episode of the convulsion is far more difficult. Words fail him. Meanwhile frustration increases his excitement, and he encounters a block consisting of muting and neuromuscular tension. The speech situation can be simply stated: Johnny is not thinking clearly in words; hence he is not talking in words. The same situation occurs with the adult, and especially with the nonfluent adult. The surge of emotion obliterates the mental speech and it augments the tension. In this manner it produces a speech-block.

In discussing the problem of the child, we must consider Dr. Wendell Johnson's 'diagnosogenic theory' (7). According to the theory, a child becomes painfully conscious of his speech when his normal nonfluency is labeled 'stuttering.' He now suffers a psychological handicap which halts his speech. This extension of the iatrogenic principle is sound. The child is rebuked and he now has a painful memory of speech. Meanwhile he forgets that he is capable of fluency, or at least of fluency consistent with his age. In this situation, of course, there is more than labeling; there are parental pressures. And when pressures are sustained, the nonfluency, at first a matter of little significance, becomes a pathological reality.

Johnson's diagnosogenic concept is of cardinal importance, but unfortunately it has not received sufficient attention from the pediatricians, the doctors who deal directly with the health of the child. This oversight appears to be due to the 'social lag' rather than medical indifference. Most textbooks on pediatrics deal with the problem of stuttering or stammering, but there is more frequent mention of handedness than of parental influences. There might well be better liaison between the field of speech and the field of child health.

We must consider the concept of primary and secondary stammering, for the speech disturbance is a complex disorder (2). Primary stammering is the speech-halting that occurs when the mental speech is flurried or muted by excitement or emotional shock. It was the stammering displayed by little Johnny, for instance, when he saw the man in a convulsion. But the term 'emotional shock' calls for explanation. There are big shocks and little shocks, and little shocks can themselves be disorganizing. Even surprise may leave one speechless.

Speechlessness, or speech-block, arising from emotional stress must be regarded as primary stammering. Secondary stammering, by contrast, consists in the stammerer's personal reaction to his speech predicament. It comprises such things as breath-holding, speech struggle, and contortion. It includes the use of 'starters' and 'wedges' which the stammerer employs to get going or to keep going. It includes the recourse to synonyms and circumlocutions with which the stammerer hopes to escape his dilemma. It also includes the anxiety and panic that accompany speech. Perhaps the most significant phase of secondary stammering is negative conditioning, conditioning against 'difficult' words and menacing speech situations. This conditioned anxiety is in itself an emotional shock and it can initiate a cycle of stammering. In this situation it can be seen that stammering tends to be self-perpetuating. As previously mentioned, secondary stammering is a personal reaction. It is exceedingly variable, and on this account, we see the impediment in countless different patterns.

The phobic phase of stammering has long been recognized, and as early as 1830, Schultess (*9*) characterized the speech disorder as *phonophobia* or *lalophobia*. Schultess regarded the fear of speech as the principal cause of the disorder. Wyneken (*12*), writing a few decades later, declared that the stammerer was a *speech-doubter*. He believed that the stammerer's fear of particular words produced a wavering of the will which reflected itself in stammered speech. Denhardt (*3*) went still further, and in his book *Das Stottern eine Psychose*, he contended that stammering resulted solely from fear and autosuggestion. He cited comparable cases of stammering in swallowing and writing, and in such coordinated activities as playing the flute and playing the piano.

These early writers made significant contributions to the science of speech pathology, but unfortunately they failed to identify the primary stammering which initiated the speech disorder. Having the advantage of a century of progress, we can view the matter a little differently. The stammering begins as a stress reaction; it continues as a phobic reaction. To complete the formula, we should add the other secondary phases already described.

In modern times, psychoanalysis attempts an appraisal of stammering. The views are divergent. One psychoanalyst contends that the stammerer is mixing suckling movements with his speech; another sees stammering as an attempt to avoid the inadvertent utterance of obscene words; a third finds the stammerer exploiting an infirmity in order to escape his responsibilities. The speech disorder is variously identified as a narcissistic neurosis, a pregenital conversion neurosis, an analization of the mouth, *etc.* The interpretations are ingenious, but unconvincing because of the lack of objectivity. Moreover, the analysts have fallen into the common pitfall of observing adult stammering rather than primary child-stammering. It might be thought that the suckling theory relates to the child; yet if one observes the toddler who has long used a 'pacifier,' he will find that the child protrudes his lips in speech, but he does not halt and hesitate.

Though psychoanalysis has added little to our knowledge of stammering, it does not follow that the therapy is without value. Psychoanalysis may be helpful to the stammerer (or the nonstammerer) who is dependent and insecure. As with other methods of speech correction, the therapist is a therapeutic agent, and the stammerer may derive assurance and confidence from his relationship with the psychoanalyst.

Perhaps stammering is best understood as a psychoneurosis, as a disorganization of function resulting from stress. But in clinical observation the disorganization is not limited to speech; it involves the speaker as well as the speech. This larger disorganization can be observed in a child's neurotic reactions to the excitement and fatigue of Christmas week. The child not only stutters, but he displays such additional symptoms as restlessness, irritability, loss of appetite, night terrors, and reversion to an infantile pattern of bed-wetting. In the oral concept we emphasize the speech disturbance, but in the biological concept we identify a broad disorganization of the personality.

A similar appraisal can be made of the adult stammerer. The speaker is a poorly integrated person who seems to have a basic lack of speech skills even when he is not stammering. Yet his lack of skills goes further. He may be poorly organized in such things

as reading, writing, dialing a phone call, and making change; he scores more 'misses' in these activities than the average person.

In any event we can take the broader biological view rather than the oral concept. At the same time we can evaluate our terminology. We see that the word *stuttering* identifies an oral speech disturbance, but the term *stammering* carries a clinical connotation, and it implies a broader concept. Words are not particularly important in this connection, but the breadth of thinking is significant.

Progress

Although there has been a great deal of work done in the field of stammering, it is disturbing to note that the progress in the science of speech pathology has not been continuous. There have not been steps of progress based on preceding steps of progress as in the physical sciences. Rather there has been a good deal of speculation, accompanied by therapy which was often irrational. It is well over a century since Schultess identified stammering as a psychoneurosis. His observations were accurate even though they related only to a unit phase of secondary stammering. His work was ignored, and a decade later surgeons were cutting sections out of the tongue to raise it from its supposedly low position. The oral mechanical devices appeared, and the speech world entered the dark ages of ignorance. The time-beating contrivances arrived, and therapy was taken over by the quacks. Later there appeared to be a spark of erudition when the theories of spasm were propounded, and when symptoms were minutely detailed in Latin terminology. Yet progress remained stalled till the universities entered the field of speech pathology a few decades ago. Happily we are now in an era of progress in which stammering is receiving scientific study.

The academic speech world is severely handicapped. The workers in this field are confronted with a disorder which probably represents the most complex disorganization of function in the field of medicine and psychiatry. Their task is stupendous. Meanwhile there is no liaison with psychiatry, and this doubtless comes from the fact that the psychiatrists themselves have given the problem little attention.

Another handicap is the fact universities deal with adolescents, and thus they encounter stammering when the original disorder is distorted by a heavy overlay of secondary symptoms. In this situation the oral features of the disorder sometimes receive weighted emphasis, while the broader biological aspects of the problem are overlooked.

One striking step in progress in the speech world is the organization of its workers into the American Speech and Hearing Association. When the members of the founding group (then the American Speech Correction Association) met in convention 30 years ago, they were able literally to sit at a round table. Today the conventions are on a major scale, for the membership comprises 5000 men and women devoted to speech correction and research.

Biological Concepts

It is impossible within the scope of this article to present the diverse viewpoints in etiology and therapy that are currently held in the field of speech pathology. As already mentioned, the thinking is fluid, and the theories have yet to jell. The biological concepts are clearly formulated,

and the author presents them here as he sees them. Not all the concepts have been tested, but at least they merit consideration.

First, the stammerer appears to be a poorly integrated person. That is to say, he does not function with full efficiency. He runs more like a Model-T than a modern V-8 model. He is inwardly excitable, and he is easily flustered and confused. He is often incoordinate in his motor reactions. The functioning of his internal organs is easily disturbed by stress. The stammerer appears to be especially nonorganized in the matter of his speech. To illustrate the point: A man with the oral skills of Peter Ustinov, for instance, can make mouth noises like a talking dog, a bugle, a violin, a bassoon and a harpsichord. He can imitate the sound of different automobiles (*11*). By contrast, the man of minimal oral skills may be unable to whistle or trill an *r* or inflect his voice. The stammerer is closer to the latter category; in fact he may be in it. In the potential stammerer we have a poorly integrated person with poorly organized speech. The condition may continue throughout life without a breakdown in speech. But if the child (or later the adult) encounters acute or sustained stress of sufficient severity, the speech becomes disorganized. The disorganization is primary stammering. The physical and emotional reaction to this experience is secondary stammering. But the speaker is disorganized as well as the speech, and this broader concept must be kept in mind.

The remedy stems from the nature of the disturbance. The therapy should attempt to reorganize the speech rather than remove the multiform symptoms of the speech disturbance. The pupil must have rich opportunity of hearing and feeling himself talking normally, and he must strive to improve the fluency in his verbal thinking. In the therapy sessions his speech is patterned by the therapist, and by records and tape recordings with appropriate pauses for repeating.[1] Meanwhile the stammerer can enlist the radio and the television set as his personal preceptors. He selects a slow and fluent speaker, and takes his pauses for repeating by turning down the volume knob; or, more simply, he uses the pauses to repeat the preceding phrases in verbal thinking. Thus in personal therapy and group therapy the stammerer can improve his fluency. But throughout, he lays emphasis on clear verbal thinking, so that fluent speech emerges when the mind broadens to the mouth. It may help the stammerer to reorganize other activities, such as reading and writing, also. This broader project involves an attempt to reorganize the speaker as well as the speech. The possibilities in this field merit full investigation.

Early Therapy

Unquestionably the most effective therapy is accomplished at the kindergarten level, where stammering is corrected in its primary stages. Better still, the stammering can be prevented. While 'speech correction' is generally disappointing, a program of preventive training should be richly rewarding. The young child needs such training. He needs speech activities in which he hears and feels himself talking normally—and with increasing fluency. A model school program would include all the children in the

[1]Pause-records can be obtained from the Interstate Press, Danville, Illinois. Four long play records are available: 'For Children,' 'For Young People,' 'For Young People and Adults,' and 'For Adults.' The records cost $3.00 each.

kindergarten and lower grades; it would include the good talkers and the poor talkers, the good talkers serving as 'guides' for those less fluent. The speech work would consist largely in group procedures; it would be made up of games more than lessons; and it would be conducted on a daily rather than a weekly basis. Through basic training, a child's speech function might be securely organized, and it should then safely withstand the impact of disorganizing stresses. A speech program in this pattern might not only prevent stammering but also improve the general quality of speech in the school.

The practicality of such a program can be easily demonstrated. It would require pioneer work in a few public schools, preferably in small communities with relatively settled populations. The results could be readily evaluated, and they might well warrant a broad acceptance of the procedures. With such a program in effect, 'A Century in Review' would conclude with happy predictions.

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Recent Investigations On Tranquilizers And Stuttering

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This paper is a report on the current status of scientific knowledge as to the effect of some of the new tranquilizing drugs on stuttering. In the past, various sedatives have been administered to stutterers, but the results have been, at best, inconclusive. Indeed, the results of such experimentation would tend to discourage investigation of yet another drug. However, the research on tranquilizing drugs has revealed such significantly different effects from the earlier sedatives that their application to stuttering was challenging.

The reason for the interest of the speech therapist in tranquilizers becomes evident upon examination of their pharmacological actions. In the first place, these drugs are not sedatives in the sense that sedation has been used heretofore. The terms tranquilization and inactivization have been selected by the pharmacologists to indicate that the drugs act primarily as tranquilizing agents, which may permit but do not cause sleep. Motor excitement is significantly reduced, without at the same time producing confusion, lethargy or deep sleep, as has been the case with previous commonly used sedatives. Moreover, the cortical electrical response remains normal in contrast to the typical pattern produced by any of the barbituric compounds, and there appears to be no impairment of intellectual functioning. Other reported effects include a slight decrease in the number of respiratory cycles per minute, a slight drop in the heartbeat rate, a slowly developing and moderate reduction in blood pressure in cases in which it was somewhat higher than average prior to the administration of the drug, and an extremely low incidence of toxic side effects. The most beneficial effect appears to be the relief of neurotic symptoms of hypertensive patients, which accounts for the increasing use of tranquilizing drugs in the treatment of individuals with emotional and mental disorders.

These specific effects of tranquilizers constitute the rationale for their application to stuttering, for such physiological symptoms as unusual respiratory functioning, increased heart rate and blood pressure, and some types of emotional disturbance are often concomitants of the disorder.

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Studies

One of the earlier studies upon the use of a tranquilizing drug in the treatment of stuttering was directed by the authors at the University of Virginia in 1955-1956 (*4*). This was a pilot study in which a single male adult stutterer was the experimental subject acting as his own placebo control. He was tested over a period of a year, using a sequence of drug (Serpasil) alone, placebo alone, drug alone, and drug plus speech therapy.

At the beginning of the experiment, the subject ranked in the fiftieth to seventy-fifth percentile on the Iowa form for stutterer's self ratings of reactions to speech situations. He stuttered on about 25 per cent of words used, with considerable muscular tension and blocks averaging two seconds in length, thus justifying classification in the severe category. A physical examination given by a physician prior to the beginning of the experiment revealed that the subject was in good physical condition with no contraindications against the use of Serpasil. Physical examinations made weekly during the entire course of the experimentation revealed no significant change in any factor except for a slight reduction in blood pressure, and the physical condition of the subject continued to remain the same as it was at the beginning of the experiment. During the first five-week period the subject took one 0.25mg. capsule of Serpasil daily and visited the clinic once each week for evaluation of his speech pattern. The measurements indicated a significant and steady drop in the percentage of stuttered words on both reading and conversation. The drop seemed to confirm previous observations that repeated administration of a small daily dose produces a cumulative effect which is higher than the threshold of effectiveness of a single dose.

At the beginning of the sixth week, and for the next four weeks, placebos were administered in place of the Serpasil. A steady and significant rise in the incidence of blocks on both reading and conversation began during the first week of the administration of the placebos, and this rise continued throughout the non-drug period. In the tenth week, Serpasil was once again administered and the incidence of stuttering again began to drop toward the lowest previous level. These results were subjected to statistical analysis and, even taking into consideration the factor of adaptation, the difference in frequency percentages between the drug and non-drug periods was significant for both the Iowa test (on reading) and casual conversation.

After 13 weeks of experimentation without speech therapy, therapy was reintroduced and continued for a period of six weeks as a supplement to the drug. Objective tests revealed that the incidence of blocks leveled off and remained at a point close to, but slightly above, the best level of fluency attained with Serpasil alone. Subjectively, the therapist reported progress in the development of a more objective attitude toward stuttering and also in improved control of an easy stutter pattern.

During the same period, Mitchell (*5*) conducted a study using reserpine in an eight-week experiment upon 16 adult stutterers. Six of them were receiving 'stuttering therapy,' eight 'terminal therapy,' and two no therapy during the experiment. Half of the group received one milligram of reserpine daily while the other half were given placebos for four weeks. During the second four-week period, the

drug and placebo groups were reversed. The stutterers were required to provide daily subjective estimates of their speech, and trained observers evaluated each of them each week. The investigator summarized the findings by reporting that

> . . . no change occurred in the severity or frequency of the stuttering blocks. But during the administration of the drug, a majority of the subjects reported that a change did occur in their speech pattern. This tendency was toward easier but more overt stuttering blocks. The subjects also noted that they could gain better control of these blocks than they could their previous ones. An improved attitude toward their stuttering also was noted and accompanied by a noticeable decrease in anxieties.

Since these investigations, several experimental projects have been completed elsewhere. Kent and Williams (*2*) studied the effect of still another tranquilizing agent, meprobamate, upon 15 stuttering college students at Indiana University. The research design included division of the subjects in therapy into an experimental and a control group, with the control group receiving a placebo in place of meprobamate. Determination of results was based upon the criteria of ratings of stuttering severity, speech interruptions during oral readings, and clinical judgments made by the experimenters. After an experimental period of 99 days, no significant difference in improvement was found between the experimental and the control groups.

Katz (*3*) also employed meprobamate in an investigation of stuttering behavior which employed a considerably different experimental design. He used 30 subjects ranging in age from 15 to 45, dividing them into three groups (meprobamate, placebo, and no medication). These subjects apparently received no speech therapy during the six-week period of the experiment. The investigator used as his criterion of speech performance the number of stuttered moments in the reading of a 500-word passage. The passage was read by each subject once a week for the period of six weeks. It was found that 'the stutterers assigned to meprobamate showed a substantial reduction in the mean number of stuttered moments.' By contrast, subjects of the placebo group showed a 'significant increase in the mean number of stuttered moments' and nonmedicated group exhibited no statistically significant change. The subjective reactions of those who were given the meprobamate were revealed in the testimony of 50 per cent of them who reported 'substantial improvement,' with another 10 per cent indicating slight benefit, and 40 per cent no change.

One final study reported in 1958 by Hackett, Hoffman, MacLeod and Surtees (*1*) involved an investigation over a nine-month period of the effects of yet another tranquilizer, chlorpromazine, as an adjunct to speech therapy for a group of 13 children. The research design of this experiment included an initial six-week period during which suggestibility was evaluated on the basis of response to placebo. All members of the group were then placed on chlorpromazine for a further six weeks. For the remaining 24 weeks of experimentation, the group was divided at random, and seven members received chlorpromazine and six placebo, in addition to speech therapy. The investigators reported that 83 per cent of the chlorpromazine group were greatly improved at the close of the experiment, whereas only 33 per cent of the placebo group showed such improvement. On a one-year follow-up, they found that there was a tendency for

continued improvement, even in the absence of therapy, among stutterers of the chlorpromazine group, whereas there was a tendency toward relapse among the stutterers who were in the placebo group.

Discussion

It seems apparent that experimentation in this area is not sufficiently extensive to justify far-reaching conclusions. However, the action of the tranquilizers appears promisingly different from the conventional barbiturates, and this tranquilizing effect may not only produce a reduction of stuttering symptoms in many or most subjects but may also render the subjects less susceptible to the sharp emotional impact of the speech situation. There is no question that, in the majority of the studies reported here, a significant change in the direction of improved fluency in the speech pattern did occur in conjunction with the administration of the drug and may reasonably be assumed to have been produced by the drug.

There is nothing to justify the conclusion that a tranquilizing drug alone will cure stuttering. It appears, however, that such a drug might be desirable as a tool in the long-range therapeutic procedure. Without entering into a discussion of the merits of the various therapeutic approaches to stuttering, one may suggest that, in cases where the psychological reactions and speech symptoms are so severe that they interfere with the patient's participation in therapy, tranquilizing drugs might provide a steppingstone to more rapid progress. There is a further possibility that a program might be developed wherein relatively heavy dosages are introduced in the early stages of therapy with a progressive reduction in dosage as the subject acquires insight into the problem and achieves voluntary control of the symptoms.

A word concerning the apparent inconsistencies of the results of the various experiments is in order. It should be noted that in the Kent-Williams, the Mitchell, and the Hackett-Hoffman-MacLeod-Surtees experiments, the measurement was made on the basis of relative improvement during therapy, while in the other projects the measurement was made primarily on the basis of reductions in the mean number of stuttered moments as a consequence of the administration of the drug. It should be further noted that these studies represent a testing of four different brands of tranquilizers, as well as a variety of dosages, which might well affect the results obtained. Hence, the lack of agreement in results may be primarily caused by the variations in experimental design. Finally, one observes that, with a disorder varying as much from one individual to another as does stuttering, the limited number of subjects used is a potentially critical weakness, even if all the investigations could be lumped together for consideration as a whole.

Summary

This report is a summary of experimental studies which have attempted to assess the effects of some of the new tranquilizing drugs on stuttering. On the basis of the results of these studies several generalizations appear justified: (1) The tranquilizing drugs seem to have properties capable of exerting an effect upon a disorder such as stuttering. (2) There are probably differences in the effects of the various drugs upon any given subject. (3)

There are indications that various subjects may respond differently to any given drug. (4) The experimentation performed to date has failed to provide the specific information necessary to predict how a specified dose of a particular tranquilizer is likely to affect a stutterer. Thus, it is impossible to make a final decision concerning the possible utilization of tranquilizing drugs in stuttering therapy on the basis of the experimentation to date. Further study, covering many subjects and employing carefully controlled research conditions, is indicated. Such a large scale study, or series of studies, should precede any attempt to apply the drug routinely in a total therapeutic program.

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Effect Of Isoniazid On The Speech Of Multiple Sclerosis Patients

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The speech of multiple sclerotic patients is often defective, but very little recognition has been given to multiple sclerosis in speech pathology literature. Perhaps this neglect stems (1) from the presumption that the disease is progressive and a program of speech therapy would not likely keep up with its 'progression' and (2) from the lack of information concerning causes and treatments for multiple sclerosis. West, Ansberry and Carr (5) point out that multiple sclerosis, resulting from tiny neoplasms, or tumors, widely disseminated throughout the central nervous system, is an active cause of dysarthria. These authors say that because of the widely scattered lesions the effect on speech is unpredictable. They suggest, however, 'The most frequent type of dysarthria that results from multiple sclerosis is a drawling, labored articulation, classically described as "scanning."' These authors also suggest that multiple sclerosis is the only one of the sclerosis diseases which progresses slowly enough to warrant a program of speech therapy.

Speech pathologists may wish to take cognizance of the attempts of medical research to discover methods to slow up the progress of the disease and to treat the symptoms. Although researchers have experimented with therapies designed to show 'over-all improvement' in the multiple sclerosis patient, the nature of the disease implies that a therapy which would improve the general muscular control would be beneficial to the control of the speech musculature as well. Recently a drug, isoniazid, which showed indications of possible benefit to the patient with multiple sclerosis has been extensively evaluated for its specific effects. In a preliminary report on the effects of isoniazid in the treatment of multiple sclerosis, Kurtzke and Berlin (2) reported evidence which indicated the drug produced beneficial results. Stimulated by the report of Kurtzke and Berlin, a group of neurologists in Veterans Administration hospitals organized a co-

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operative clinical study of isoniazid therapy for multiple sclerosis, utilizing 186 subjects from 11 hospitals. During the course of the cooperative Veterans Administration study (*4*), the authors were able to secure tape recorded samples of the speech of 65 patients. The present paper reports the effects of isoniazid on the speech of a group of these patients with multiple sclerosis.

Method

Subjects. Speech samples from a total of 65 patients from six different hospitals were made available to the present authors. However, for various reasons such as incomplete standard recordings, poor recording procedures, *etc.*, the total number of usable subjects was reduced to 22. All subjects included satisfied the criterion of clinical diagnosis of multiple sclerosis as outlined by Nagler, *et al.* (*4*).

Administration of Isoniazid. A fixed dosage of 100 mg. of isoniazid was administered, three times daily, over a period of at least three months to the experimental patients and a control placebo, unidentifiable either to the patient or the administering physician, was administered to the control group. None of the personnel working with the patients had knowledge of which were control and which were experimental subjects. Procedures for accomplishing the administration of drug and placebo are outlined by Nagler, *et al.* (*4*). Twelve of the 22 subjects received isoniazid and 10 placebo.

Obtaining the Speech Samples. Recordings of the subjects' speech were made in the various participating hospitals. Standard recording instructions were sent to each hospital. The subject was initially told that his condition sometimes affected speech and that a recording of his speech was desired. The recordings obtained included (1) a conservational interview, (2) a paragraph reading and (3) an articulation test. For all subjects reported in the present paper, a paragraph reading was obtained and this paper reports only the data based upon the analysis of the subjects' reading of the paragraph. The following paragraph which the patient read was typed in capital letters to omit reading difficulties:

> The trees set out to choose a king to rule over them. They asked the olive tree to be king, but the olive tree said, 'I am busy making olives and oil; I can't stop to be your king.' Then they asked the fig tree, but the fig tree said, 'Do you expect me to leave off making my good fruit, just to be king over you?' Then they asked the grapevine to be king, and the grapevine said, 'Shall I leave my wine that gives cheer and comfort to so many, only to be king?' At last the thornbush was the only one they could get to be king.

Subjects who could not read the paragraph for any reason, including visual difficulties, were not utilized in the present analysis. Recordings were made prior to administration of isoniazid or placebo and again after three months or more of the prescribed therapy. Additional therapy received by the patients during the three-month period included no drugs and consisted primarily of physical therapy given to all patients.

Analysis of the Speech Samples. The pre- and post-therapy paragraph readings from the 22 subjects were dubbed onto another tape from the original recordings. Each subject was identfied by a number on the dubbed tape and the order of occurrence of pre-post or post-pre test was randomly determined. The resulting tape thus

contained a series of 22 pairs of paragraphs. Each pair contained the pre- and post-therapy speech samples of the same subject. Pre-therapy sometimes appeared as the first sample in the pair and sometimes as the second. The order of occurrence of pre- and post-therapy readings in each sample was determined randomly. A normal voice was also recorded on the dubbed tape introducing each speech sample as follows: 'This is pair number 1, sample number 1,' 'This is pair number 1, sample number 2, *etc.*' Each of the series of 22 pairs was introduced in the same manner. A practice pair containing two samples was recorded at the beginning of the tape.

The speech samples prepared as indicated above were played to four different groups of listeners. Three of the groups consisted of students in speech correction classes at the University of Pittsburgh. The fourth group consisted of graduate assistants in speech and hearing disorders at the University of Pittsburgh. A total of 42 listeners were used. The samples were played to listeners through the speaker of a tape recorder. An attempt was made to locate the speaker at approximately the same distance from each listener. No attempt was made to utilize high fidelity equipment in the listening sessions because recordings had been previously made using several different clinical type recorders. Listening sessions were conducted in ordinary classrooms with no special sound treatment.

Each group of listeners was asked to compare sample 2 with sample 1 of each pair and rate sample 2, with respect to sample 1, on a five-point scale as follows: Sample 2 is a great deal worse, a little worse, the same as, a little better, or a great deal better, than sample 1. They were cautioned to avoid comparing samples between different pairs but to compare only sample 2 with sample 1 of the same pair. They were requested to compare every pair of samples and to make a guess if they were unsure of their evaluations. It was felt that a rating indicating general over-all goodness or badness would provide a better rating for the purposes of the present study than ratings of more specific phenomena such as intelligibility or voice and articulation errors. The instructions as outlined above were given on a rating sheet provided for each listener. They were also presented to the listeners orally by the experimenter. After the instructions were presented, the practice pair was played to the listeners and time was provided for questions and clarification of the instructions. The pairs of speech samples were then played to the listeners and rated on the five-point scale as indicated above.

After the listener group had rated each pair of speech samples, the listener evaluations were quantified as follows:

Rating	*Quantification*
a great deal worse	0
a little worse	1
the same	2
a little better	3
a great deal better	4

The data were treated so that each rating represented the *change between pre-therapy and post-therapy* for each subject rather than change between sample 1 and sample 2. This was accomplished by reversing the ratings for each pair in which sample 1 contained the post-test and sample 2 the pre-test.

The reliability of the listeners in each listener group was determined separately by analysis of variance procedures. The reliability of listeners in

each group was similar. There were no significant differences between the mean ratings of the groups. The groups were, therefore, combined to form a total group of 42 listeners. The reliability of the combined listener ratings provided by all 42 listeners was .93.

After the listener ratings had been quantified and the listener reliability determined, the multiple sclerosis subjects were divided into experimental and control groups, using a code sheet provided by the Central Office of the Veterans Administration. Until this point in the experiment, the experimenters themselves had no knowledge of which subjects belonged in each group.

Results

The data provided by the ratings of 42 listeners were analyzed to determine whether there were any significant differences between experimental and control groups in terms of a change in their speech from pre- to post-test. A mean rating for each subject, representing a comparison of post-test with pre-test, was determined for each subject from the ratings of the 42 listeners. The significance of the difference between the means of the experimental and control groups was determined by utilizing the *t* test described by Guilford (*1*).

The numerical difference between the means of the two groups on change scores from pre- to post-test was very small. The mean of the experimental group receiving isoniazid therapy was 2.26 and the mean of the control group receiving the placebo was 2.18. The numerical difference of .08 yields a *t* of .3302. With 20 degrees of freedom which are available from the data a *t* of 2.086 is required for significance at the five per cent level of confidence. The conclusion that may, therefore, be derived from these data is that there is no difference between the experimental and control groups with respect to a change in their speech from pre- to post-test. The very small numerical difference between the means appears to be a chance occurrence.

Because of the exceedingly small value of *t* determined from the data, the conclusion of no difference between the groups seems justified even though there were some factors which may have operated to obscure a possible difference. The tapes provided to the experimenters by the various hospitals were extremely noisy and could have influenced the ratings of the listeners. High fidelity recording and playback equipment was not used and this may have tended to obscure possible differences in the speech samples. A third factor which may have limited the conclusions which can be drawn was the ultimate selection of subjects used. Although the 22 subjects used were probably randomly drawn from the larger group, the use of only those subjects who could read the paragraph rather than repeating it after the examiner should be mentioned. However, within the rather severe limits we must place on the data of the present investigation, we conclude that the use of isoniazid did not improve the speech of the subjects studied. This finding is consistent with the generally negative results of isoniazid therapy reported by Nagler (*4*) and by the 1957 report of Kurtzke and Berlin (*3*).

Another factor of possible interest is the tendency of the ratings of the post-test to be slightly better than those of the pre-test *for all*

subjects. The means of the two groups are slightly above 2.0 (the rating which indicates that the two samples are judged to be the same). The means were 2.18 and 2.26. Although these ratings are slightly 'higher' than 2.0, we cannot conclude that the speech of the subjects in either group improved over the three-month course of treatment. The design of this study and the data provided by this study do not allow for a statistical evaluation of that question.

Summary

Twelve experimental subjects who were given dosages of isoniazid over a period of at least three months and 10 control subjects who received dosages of a placebo over the same length of time each contributed recorded speech samples made prior to and following the therapy period. The speech samples were rated by 42 listeners in such a way as to enable an analysis of the differences between the control and experimental groups in terms of change in speech behavior from pre- to post-test recordings. The results indicated that there was no significant difference between the two groups as far as changes in speech behavior were concerned. It was concluded that isoniazid did not improve the speech of the subjects in this study.

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Speech Analysis Of 263 Cleft Palate Cases

Margaret C. L. Greene

A group of cleft palate patients attending the Stoke Mandeville Plastic Surgery Clinic over a period of three years was selected for speech assessment. The clinic team under the direction of Professor T. P. Kilner consisted of plastic surgeons, dental surgeons, orthodontists and speech therapists. Weekly staff meetings took place in order to discuss problems and plan treatment through a team approach.

The cleft palate patients consisted of two distinct groups: (1) 'Primary' cases—those who were treated exclusively since infancy at this unit and (2) 'Secondary' cases—those who had been treated elsewhere and were referred to this clinic generally on account of inadequate speech. The surgical procedures on Secondary cases were mostly unknown. In all Primary cases the program followed was repair of lip and alveolus at three months and the Wardill-Kilner (*6*) V-Y retroposition of the palate at one year.

The patients were classified according to type of cleft, as follows: Group 1, post alveolar clefts of soft and part or all of hard palate; Group 2, unilateral cleft of lip and alveolus extending as far as the soft palate; Group 3, bilateral clefts of lip and alveolus extending through hard and soft palate.

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Speech Examination

Each patient was examined by two speech therapists in order to assess (1) nasopharyngeal competence, (2) articulation and (3) nasality. Disc recordings were made at intervals to check the speech progress.

Nasopharyngeal Closure. The adequacy of nasopharyngeal closure was tested by (1) the degree of clouding of a cold mirror held beneath the nostrils when the patient articulated vowels and consonants in isolation, (2) blowing out a carnival blower and (3) blowing into a Windsor Measure and forcing water up a graduated tube. These tests, however, were found to provide no reliable index of the patient's ability to manage his nasopharyngeal mechanism in speech. Some patients failed the tests but spoke well; others succeeded but had inadequate speech. The surgeons came therefore to rely upon lateral soft tissue radiography, with barium outline of palate and posterior pharyngeal wall, as the best means of judging the length of the palate in relation to the depth of the pharynx when speech was unsatisfactory and further surgery under consideration.

Articulation. For the purposes of this report dyslalic speech, whether due to immaturity, emotional disorder or deafness, but *without nasal stigmata*, was counted as normal. Defec-

TABLE 1. Speech analysis of 110 Secondary cases and 153 Primary cases of cleft palate.

	Group 1				*Group 2*				*Group 3*			
	Secondary		*Primary*		*Secondary*		*Primary*		*Secondary*		*Primary*	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Number of cases	18		31		55		83		37		39	
Normal speech always	0		8	25.8	8	14.5	50	60.2	6	16.2	18	46.2
Nasal escape only	6	33.3	3	9.7	8	14.5	9	10.8	4	10.8	6	15.4
Nasal articulation	12	66.7	17	54.8	35	63.6	2	2.4	19	51.4	2	5.1
Lateral articulation	0		3	9.7	4	7.3	22	26.5	8	21.6	13	33.3
Speech normal after further treatment	6	33.3	8	25.8	9	16.4	19	22.9	12	32.4	2	5.1
Eventual total of normal speakers	6	33.3	16	51.6	17	30.9	69	83.1	18	48.6	20	51.3

tive articulation, classified according to type of defect in evidence and not according to degree, was found to fall into one of two categories:

(1) Nasal Articulation. This category includes all defects typical of the speech of cleft palate patients who have an incompetent velopharyngeal sphincter. Characteristic errors are the substitution of glottal for oral plosives and the use of nasal or glossopharyngeal sounds for sibilants, fricatives and affricates.

(2) Lateral Articulation ('lateral lisp'). The term lateral articulation refers to the utterance of consonants that are positionally correct but are produced with depression of the tongue laterally. These cases had a competent velopharyngeal sphincter but defective articulation due to presence of oral irregularities. Sibilants and palatal fricatives and affricates were most commonly involved.

Nasality. The assessment of audible nasal escape and excessive nasal resonance, muffled tone, *etc.*, was always difficult since no satisfactory objective means of describing such phenomena is yet established. Sometimes the speech therapists had to give way to their colleagues when the general consensus of opinion was that speech fell within normal limits in some cases in whom articulation was correct but there was some abnormality of vocal tone. Even so, a number of cases with good articulation were judged to have unsatisfactory speech, either on account of excessive nasal escape or nasal resonance, and these cases are recorded in the tables as having 'nasal escape only.' We did not find any cases with both lateral articulation and nasal escape.

Speech Analysis

In Table 1, the figures in the Secondary cases demonstrate that nasal escape and nasal articulation are the chief hazards when primary repair of the palate is unsuccessful. On the other hand, the primary repair of the palate by the technique used at the Stoke Mandeville Unit, the Wardill-Kilner (*6*) V-Y retroposition of the palate, shows that the problem of providing the cleft palate patient with a competent palato-pharyngeal sphincter is largely solved. The number of patients with nasal articulation in Group 1 Primary cases is not representative of the effectiveness of the Wardill-Kilner procedure. Reidy (*8*), the present director of the unit, has

TABLE 2. Lateral articulation in Primary cases of cleft palate.

	Group 1		*Group 2*		*Group 3*	
	N	%	*N*	%	*N*	%
Number of cases	14		81		37	
Lateral articulation	3	21.4	22	27.2	13	35.1
Correct articulation	11	78.6	59	72.8	24	64.9

recently published his results in 100 Group 1 clefts operated upon by himself in which he reported 77.5 per cent of the patients had no nasal speech symptoms.

The most interesting feature of the figures in the Primary cases is the high incidence of lateral defects in articulation, an incidence which increases in direct proportion to the decrease in nasal articulation, as more patients make use of the oral cavity in articulation.

Table 2 presents the total number of cases using the oral cavity in articulation and the proportion of cases with lateral defects compared to those with normal articulation.

In theory there should be no lateral defects in articulation in Group 1 since there is no alveolar deformity or dental irregularity in these cases. The three cases who had lateral articulation, however, had oral defects: one had a relative prognathism and two had a small fistula in the anterior hard palate. Speech became normal in one case when the fistula was closed.

The problem of lateral articulation in cleft palate is apparently an increasing one. This type of defective speech has not yet been recognized in the published figures of plastic surgeons who are quite naturally still orientated to the provision of a competent sphincter and prevention of nasal speech. Reidy (*8*) has included patients with lateral lisp as normal speakers among repaired cleft palate cases. Hynes (*5*) is apparently equally preoccupied with the detection of nasal articulation among his cases.

Lateral articulation is free from cleft palate characteristics in the old and accepted conception of cleft palate speech and is therefore commonly dismissed as lisping. Yet it can be a conspicuous defect and a cause of embarrassment to the speaker. The lateral lisp is an obstinate defect to correct. However, prognosis is improved by orthodontic treatment and by prostheses that fill spaces between the teeth or provide a better contour of the maxillary arch. In some cases orthodontic treatment alone corrects the speech defect.

The fact that lateral articulatory defects are included in this survey of cleft palate speech reduces the eventual total of normal speakers. If lateral defects are classified as normal speech, then our figures agree more closely with those of our surgeons. We found 86.7 per cent unilateral clefts and 79.5 per cent bilateral clefts having normal speech after primary repair of the palate and with no further surgical treatment necessary.

There is considerable disagreement in the literature concerning the connection between oral anomalies and defects in articulation. The old textbooks took it for granted that a correlation existed, but nowadays it is

fashionable to believe that there is no true relationship between the two and Van Thal *(10)* adopts this view. Hopkins and McEwen (*3*) believe that other factors such as social status, emotional stability, hearing and intelligence play a part. Graber (*2*) noted that the teeth and supporting structures on the side of the cleft were higher and speech hazards result. McNeil (7) is in no doubt that malposition of the teeth causes speech defects. It is certainly difficult not to believe that there is some connection between oral defect and lateral articulatory defects in cleft palate cases since this type of defective speech occurs in less than one per cent of cases among the normal populaton and approximately 19 per cent of our cleft palate cases.

In an attempt to clarify the situation, Foster (*1*) undertook the examination of the oral anomalies in all the patients in our group of cases who were using the oral cavity in articulation and also receiving treatment in the dental department which made plaster models available. These amounted to a total of 102 cases. It was thought that perhaps collapse of the maxillary arch with consequent reduction in tongue space might be significant or that gaps between upper and lower teeth and spaces between adjacent teeth in the region of the alveolar cleft might be a causal factor. Foster examined the cases from these two most common aspects of the cleft palate oral deformity. His figures showed no difference between the patients with lateral and normal articulation in regard to gaps in occlusion and in the cleft. The difference between the number of patients with lateral and normal articulation related to collapse of the maxillary arch, however, was just significant statistically at the conventional level of probability. This fact allows us to conclude that there is some evidence that degree of collapse of the maxillary arch differs between patients who have normal speech and those who have lateral articulation. This observation lends added interest in England to the work of McNeil (7), who is molding the upper arch of the Group 2 and 3 cleft palate infant with an acrylic splint at the age of two-to-three weeks, before surgical repair of the lip and alveolus is undertaken. Selected cases are now being treated in this way at Stoke Mandeville and other centers and we shall follow the speech development of these children with considerable interest.

TABLE 3. Normal speech after secondary surgery on cleft palate patients.

Operation	*Number of Cases*	*Normal Speech Eventually Achieved*
V-Y on palate	25	9
Rosenthal pharyngeal flap	2	0
Rosenthal + V-Y	3	2
Hynes pharyngoplasty	7	4
Hynes + V-Y	15	4
Wardill pharyngoplasty	8	2
Wardill + V-Y	4	3
Total	64	24

Foster's (*1*) examination was confined to patients of seven-to-eight years and over. The oral conditions at this age may have been very different in some cases from those pertaining at the age of two-to-three years when incorrect habits in articulation are formed.

Secondary Surgical Treatment

Our survey included the speech results following secondary surgical

TABLE 4. Nasal escape after secondary surgery on cleft palate patients. $\chi^2=9.58$, $n=1$, $.01>P>.001$; significant.

Speech Therapy	*Normal*	*Not Improved*	*Total*
Given	13	1	14
Not given	4	10	14
Total	17	11	28

treatment on 60 Secondary and four Primary cases. (In England no prosthodontic appliances are made to correct nasal escape and surgery is relied upon exclusively.) A variety of surgical procedures were carried out with only fair success as Table 3 shows.

In most Secondary cases the palate was scarred and immobile. Many patients had been subjected to more than one unsuccessful operation in childhood and presented a difficult problem in rehabilitation for surgeon, orthodontist and speech therapist. Fortunately such cases are now rare and we were fortunate from the point of view of experience to have the opportunity of examining and treating so many who came forward when the Health Service was nationalized in England.

The number of cases receiving each of the several types of operation is too few to allow conclusions to be drawn with regard to the relative merits of each type of operation; each had its successes and failures. The Hynes (*4*) pharyngoplasty is now considered to be the most effective and is most commonly practised. However effective the pharyngoplasty operation may be with regard to reducing the dimensions of the pharynx, it may not compensate for a short and immobile palate, and this condition appears to have been the reason for lack of speech improvement in most cases.

It was found that secondary surgery alone seldom achieved much improvement in speech without being followed by speech therapy, even in cases where articulation was correct and nasal escape the only symptom. Table 4 shows the speech results following secondary surgery only and following secondary surgery plus speech therapy when articulation was correct and nasal escape the only defect. Those who did not have speech therapy either did not want it or could not arrange to have it.

Table 5 shows the result of secondary surgery alone compared with secondary surgery plus speech therapy, in cases where nasal articulation and nasal escape or resonance were present, this being a more difficult defect to correct than that of nasal escape only. The single patient who had no speech therapy but corrected articulation did so by working with his own recording machine. Of the 17 cases who improved with speech therapy, all achieved correct articulation, but 10 retained some nasal escape. A bulb type prosthesis in many of the cases might have proved more satisfactory than surgery, but this is not a view to which our surgeons subscribe.

TABLE 5. Nasal escape and nasal articulation after secondary surgery. $\chi^2=14.14$, $n=1$, $P<.001$; significant.

Speech Therapy	*Improved*	*Not Improved*	*Total*
Given	17	5	22
Not given	1	13	14
Total	18	18	36

Summary

The primary repair of the palate by V-Y retroposition yields good results and a high percentage of non-nasal speakers. Lateral defects in articulation, though a less serious problem than nasal artculation, are more common among our patients and present a problem which is increasingly engaging the notice of surgeons and orthodontists.

Secondary surgical procedures in the form of pharyngoplasties are not very successful when the palate is scarred and immobile, though considerable speech improvement is obtained in most cases with the help of speech therapy after operation. Pharyngoplasty operations are undoubtedly more successful when primary repair of the palate has produced a mobile, though short, palate.

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Clinical Efficiency In Compensation Audiometry

Otto J. Menzel

Malingering is a major problem in audiometry for compensation purposes, not merely because of its common occurrence, but also because the determination of true organic hearing level in the face of voluntary exaggeration is very time consuming, whether successful or not. An important reason for this is the fact that a malingerer who knows that his previous responses have aroused suspicion will typically persist in his pretense in order to 'save face.'

The experienced clinician seeks to provide a graceful way for the malingerer to change his responses without the implication that his previous responses were deliberate misrepresentations. A common device is to repeat the instructions in great detail, suggesting that they were not clear the first time. However, this approach is not always effective and much valuable time is often wasted before the organic hearing level has been ascertained.

It is reasonable to suppose that a substantial saving in time and effort would ensue if the intended malingerer could be induced to abandon his plans before committing himself to inflated threshold responses. The possibility was considered that certain audiometric tests, such as the electrodermal response test (EDR), might be more likely than others to discourage the as yet uncommitted malingerer.

The present experiment was devised to ascertain whether the order and sequence in which the several types of audiometric tests are administered have any effect on the incidence of nonorganic components of hearing loss.

Procedure

The subjects were 450 veterans examined for compensation purposes at the VA West Side Hospital in Chicago. Each was assigned, in rotation, to one of six groups labeled A to F. All subjects were given a test battery consisting of: (1) pure-tone audiogram, air- and bone-conduction; (2) EDR thresholds for 500, 1000 and 2000 cycles; (3) monaural speech reception thresholds; (4) monaural PB-max scores; (5) Doerfler-Stewart, speech Stenger and shifting speech tests, whenever applicable; (6) at least one repetition of voluntary threshold tests for both pure tones and speech, except when the first test showed normal hearing; and (7) any other test deemed necessary to obtain the best possible estimate of true organic threshold, including pure-tone Stenger, electrodermal SRT, Lombard, delayed speech feedback, combined speech and lip reading test, *etc.*

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TABLE 1. Test sequences used with the several experimental groups.

Group	*Sequence*		
	First	*Second*	*Third*
A	EDR	Speech	P/T
B	Speech	P/T	EDR
C	P/T	EDR	Speech
D	EDR	P/T	Speech
E	Speech	EDR	P/T
F	P/T	Speech	EDR

The six experimental groups differed only with respect to the order and sequence in which the several tests were administered. For this purpose, all tests were assigned to one of three categories: tests based on voluntary responses to pure tones, tests based on voluntary responses to speech stimuli, and EDR. These three categories of tests were arranged in all six possible sequences, and a different sequence was assigned to each of the six groups of subjects, as shown in Table 1.

The several tests based on voluntary responses to speech stimulation were consistently administered in the following order: (1) Doerfler-Stewart test (if binaural SRT exceeded 16 db), (2) monaural SRT, (3) speech Stenger (if SRT scores for the two ears differed by more than 16 db), (4) shifting speech test (under same conditions as speech Stenger) and (5) monaural PB-max. Other tests were deferred until all the more basic tests, including voluntary and EDR audiograms, were completed. Repetitions of any tests were likewise deferred until completion of the first round of testing.

In order to eliminate bias, a different clinician was assigned to each of the three test categories, administering the tests in his category without knowledge of any previous test results. Clinicians were rotated independently of subject rotation. After the initial round of tests, testing was continued in the normal way with access to previous scores, until good estimates of organic threshold were obtained or until it became apparent that none were forthcoming.

Each subject was classified as to the presence or absence of a nonorganic component (NOC) of hearing loss on basis of the following criteria:

A subject was considered to exhibit NOC if (a) two or more tests for NOC yielded positive indications, or (b) a discrepancy of six db or more was found between any of the following: (1) first SRT and best SRT, (2) first P/T and best P/T,[1] (3) first P/T and first SRT, (4) first P/T and EDR, and (5) first SRT and EDR.

An exception to these criteria was that in cases of markedly downward sloping audiograms (in excess of 15 db per octave in the speech range), discrepancies between first P/T and first SRT were not considered.

In regard to EDR thresholds, it should be pointed out that these were recorded and interpreted as conservative limits of organic hearing loss; *i.e.*, the values recorded represented the lowest levels at which unmistakable EDR responses were obtained. Thus the final estimate of true organic loss was not necessarily based on EDR responses. Moreover, discrepancies of six db or more between EDR and voluntary thresholds were considered significant as indicators of NOC only

[1]The conventional average of thresholds for 500, 1000 and 2000 cycle tones was used to express the loss for pure tones, both voluntary and EDR.

TABLE 2. Incidence of NOC.

Sequence	NOC Yes	No	Total	% NOC
A	17	58	75	22.7
B	21	54	75	28.0
C	35	40	75	46.7
D	21	54	75	28.0
E	19	56	75	25.3
F	37	38	75	49.3

TABLE 3. Incidence of NOC.

First Test	NOC Yes	No	Total	% NOC
EDR	38	112	150	25.3
Speech	40	110	150	26.7
P/T	72	78	150	48.0

TABLE 4. Incidence of NOC.

Position of P/T	NOC Yes	No	Total	% NOC
First	72	78	150	48.0
Second	42	108	150	28.0
Last	36	114	150	24.0

TABLE 5. Effect of sequence on number of tests required.

Sequence	Number of Tests
A	19.5
B	19.2
C	20.3
D	19.1
E	19.9
F	18.5
All with NOC	19.4
All others	15.2
Difference	$4.2 \pm .4$

when the EDR thresholds were better than the voluntary thresholds.

The EDR test was sometimes repeated, but not routinely. Where two or more EDR tests yielded different scores, the best EDR thresholds were used in tabulation, since these, too, constituted conservative limits of organic hearing loss.

For the purpose of computing the total number of separate tests administered in each case, left and right ears were counted separately, as were air conduction and bone conduction, and repetitions of any test.

Results

Tables 2, 3 and 4 show the effect of test sequence on the incidence of nonorganic component. It is immediately apparent that the incidence of NOC among subjects in groups C and F is markedly greater than for the remaining groups, the difference being significant well beyond the one per cent level of confidence. Differences among groups A, B, D and E were nonsignificant, as was the difference between groups C and F.

By reference to Table 1 it will be seen that C and F are the two sequences in which a voluntary audiogram was the first test administered. Thus Tables 3 and 4 confirm that *the incidence of nonorganic component was significantly greater whenever a voluntary pure-tone audiogram preceded all other tests, but was seemingly unaffected by other aspects of order and sequence.*

Table 5 summarizes the mean number of tests required for subjects exhibiting NOC, compared with the corresponding number of tests needed for subjects not exhibiting NOC. It was found that, while sequence as such exerted no significant effect on number of tests, subjects with non-

TABLE 6. Frequency of significant differences between pairs of threshold estimates among subjects exhibiting NOC.

	First SRT —Best SRT	*First P/T —Best P/T*	*First P/T —First SRT*	*First P/T —EDR*	*First SRT —EDR*
6 db or more	62	122	136	110	48
Less than 6 db	88	28	14	14	76
Total	150	150	150	124	124
% 6 db or more	41	81	91	89	39
Mean differences	6.7 db	14.1 db	12.2 db	16.4 db	5.7 db
Standard error	2.1 db	2.2 db	2.3 db	2.2 db	2.2 db

organic components of loss required, on the average, 28 per cent more tests than all others, regardless of testing sequence used. This difference is significant at the one per cent level.

Tables 6 and 7 give some indication of the relative sensitivity and usefulness of the various clues to nonorganic hearing loss used as criteria in the present study.

Table 6 compares the various pairs of threshold estimates mentioned under 'Procedure' as to the number of subjects with NOC showing discrepancies of six db or more, as well as the mean discrepancies. It can readily be seen, for example, that the difference between the first SRT and the best SRT is often not significant, even in the presence of a known nonorganic component. On the other hand, the great majority of subjects with NOC exhibit discrepancies of six db or more between the first pure-tone test and the first SRT.

TABLE 7. Effectiveness of certain tests in detecting NOC when present.

	D-S	*Test Speech Stenger*	*Shifting Speech*
Number positive	48	26	18
Number negative	35	29	29
Total cases applicable	83	55	47
% positive among all cases with NOC	32	17	12
% positive when applicable	58	47	38
% true indicator for NOC group	92	85	68
Range of NOC in cases not detected by test	6-14 db	8-16 db	6-23 db

In regard to Table 7, it should be noted that similar data relative to other tests for nonorganic hearing loss were omitted because these were not done routinely and hence are not strictly comparable. The table is largely self-explanatory. The percentage figures in the next to last row are consistently greater than those in the preceding row because there were subjects whose NOC did not involve hearing for speech, and where a negative result was correct and not indicative of failure on the part of the test to detect the NOC. It should be noted, however, that there were 24 cases of positive D-S where the nonorganicity also affected only pure-tone thresholds.

Finally, the data show that out of 150 veterans exhibiting nonorganic hearing loss, only 50 had bilaterally normal hearing. The remaining 100

all exhibited some organic hearing impairment (16 db or greater) with NOC superimposed.

Discussion and Conclusions

The traditional procedure of obtaining a voluntary pure-tone audiogram before administering EDR or speech audiometry must be reevaluated in the light of the findings of this study. The data indicate that the incidence of nonorganic hearing loss can be substantially reduced by routinely deferring conventional pure-tone audiometry until either speech or EDR tests, or both, have been administered.

The desirability of so reducing the incidence of NOC is emphasized by the finding that, regardless of test sequence, individuals exhibiting nonorganic components of loss require a greater number of separate tests in order to determine the organic hearing level. At that, it is reasonable to suppose that the saving in clinician-hours would be greater than the reported saving in number of tests, since each test typically takes longer to administer when a nonorganic component is present than when it is not.

Three interrelated facts that bear further explanation are:

1. There was a definite tendency for speech thresholds to be less inflated than pure-tone thresholds.

2. Speech and EDR audiometry appeared to be equally effective, when in first position, in reducing the incidence of NOC.

3. Whenever the D-S was positive, a nonorganic component was found on basis of criteria other than the D-S itself. Nevertheless, out of 48 cases in which the D-S was positive, 24 had nonorganic components involving only pure tones and not the SRT.

The implication of these three observations is that the Doerfler-Stewart test, quite aside from its sensitivity in detecting NOC, has a decidedly motivating effect as well. It will be recalled that the D-S routinely preceded the first monaural SRT. The first and second binaural speech reception thresholds that form a part of the D-S differed by six db or more in the majority of cases of positive D-S. Apparently then, it was a common occurrence for the first *binaural* SRT to be inflated, but not the first *monaural* SRT.

Clearly, the scores obtained on various tests were influenced by previous testing. Consequently, the relative usefulness of specific clues to nonorganicity is in part a function of the test sequence. Thus, Tables 6 and 7 must be interpreted with caution, since the relative sensitivity of specific clues in detecting NOC might be quite different under different testing conditions. For example, the figures in the last column of Table 6 would probably have been higher if monaural speech reception thresholds had routinely been obtained before the Doerfler-Stewart test.

It becomes evident that 'clinical efficiency,' in the sense of effective methods of detecting NOC, and 'clinical efficiency,' in the sense of conserving clinician-hours by reducing the frequency of occurrence of NOC, are separate but interrelated aspects of the problem.

Summary

Systematic variation of test sequence in the otherwise routine audiometric examination of 450 veterans for compensation purposes resulted in the following observations:

1. The incidence of nonorganic hearing loss, as defined for this study,

was considerably lower when the conventional pure-tone audiogram was deferred than when it was the first test administered.

2. Subjects exhibiting nonorganic components of hearing loss required a significantly greater number of tests than those who did not.

3. The data suggest that the Doerfler-Stewart test, aside from being a sensitive detector of nonorganicity, also serves as an important motivational device in discouraging the would-be malingerer.

4. Further research is needed to explore the motivational aspects of clinical audiometric procedures along with concomitant aspects of problems of detection.

Sudden Unilateral Hearing Loss Attributable To Mumps

John J. O'Neill

Sudden deafness has been attributed to many factors. The major of these have been viral infections, vascular accidents affecting the internal auditory artery, trauma, tumors, idiopathic hydrops, bacterial labyrinthitis and psychological factors. Within the last few years investigators have evidenced increased interest in the study of causes of sudden deafness. Everberg (*1*) described five cases of unilateral deafness following mumps. These cases were diagnosed from a population of 112 cases of sudden deafness. Two cases of sudden deafness due to cerebello-pontine angle tumors were described by Hallberg, Uihlein and Siekert (*2*). The role of virus infection in sudden deafness has been evaluated by Lindsay (*3*). In 1957 Van Dishoek and Bierman (*5*) reported on 100 cases of sudden deafness. Of these, 14 cases were the result of mumps and 14 the result of other viral diseases. Van Dishoek was one of the first investigators to utilize complement fixation methods (serologic tests) to establish the presence of mumps. Recently, Saunders and Lippy (*4*) reported the results of an investigation of the causes of sudden unilateral nerve deafness. This study utilized two types of antibody tests in the evaluation of the possible relationship between sudden deafness and the presence of mumps. The authors showed a definite relationship between the presence of mumps without parotitis and sudden hearing loss.

In the majority of the studies listed above, very little attention was paid to the audiometric evaluation of individuals exhibiting sudden, unilateral hearing loss attributable to mumps. It is well known that epidemic parotitis may be complicated by a hearing loss. However, it is not generally recognized that some patients may have mumps without parotitis just as some individuals may have poliomyelitis without paralysis. It is the purpose of this study to report on the results of the audiometric testing of six cases of severe hearing loss attributable to mumps without parotitis.

Of the six cases studied, four had positive mumps viral antigen titers while the other two cases had antibody titers that were presumptive for mumps. Thus it could be said that four of the patients had mumps and two probably had mumps. These six cases, which were a part of the population described by Saunders and Lippy, were administered a battery of audiometric tests, including pure-tone threshold tests (air- and bone-conduction), speech reception and speech discrimination tests, tests of recruitment as well as functional hearing

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tests (Doerfler-Stewart, delayed sidetone and, in some instances, electrodermal audiometry). Complete case history as well as medical history material was available.

Symptoms

Although not pathognomonic, the deafness associated with mumps is clear-cut. The diagnosis may be suspected as soon as the history is taken and a few simple audiometric tests administered. The following characteristics were typical for the six cases under study. The onset of deafness was very abrupt, sometimes instantaneous. One patient, for example, heard a click in her ear and knew she was deaf. Others woke up in the morning with a severe loss of hearing. The hearing loss was very severe, and in the instances of the present clinical population the loss was unilateral. Initially most of the patients could not understand a loud shout near the affected ear. The hearing usually improved over a period of time. One of the patients regained normal hearing within two months. The hearing of four of the patients improved from a severe hearing loss to a moderate loss of hearing. Only one of the patients failed to regain some hearing and she has remained nearly totally deaf for the affected ear. Tinnitus was present in five of the patients and vertigo was present in three of the patients. Otolaryngology physical examination was normal for all patients.

Test Findings

Pure-Tone Findings. The pure-tone audiograms were flat types with some slight downward sloping at 4000 cps. The average decibel loss (500 to 2000 cps) was 60.2 db. The bone-conduction patterns were somewhat bizarre in that all but one of the cases exhibited bone-conduction thresholds which were lower than the average air-conduction thresholds. The overall average bone-conduction loss was 40.8 db.

Speech Reception and Speech Discrimination Tests. The recorded W-1 and W-22 tests were used to obtain speech reception thresholds and speech discrimination scores. Test presentation was monaural with only the affected ear being tested. In all instances the average speech reception threshold for the affected ears was higher than the average pure-tone loss (78.2 db as compared to 60.2 db). This amounted to an average difference of 18 db. All of the patients described speech as blurred, jumbled and difficult to understand. The results of the discrimination tests were of special interest. The average discrimination score was 39.7 per cent. However, two of the six subjects obtained relatively high discrimination scores, 92 per cent and 86 per cent. The other four subjects obtained very low discrimination scores. The two patients who received the high discrimination scores were the patients who had been listed as 'possible' mumps cases.

Tests of Recruitment. Alternate loudness balance tests were utilized to test for the presence of recruitment. Partial recruitment was present in the instance of three patients. Of the other three cases, one was totally deaf, and two of the patients did not exhibit recruitment. The last two patients were the 'possible' mumps cases.

Tests for Functional Hearing Loss. In that the responses for the other audiometric tests could be construed as evidence of possible functional hearing loss, several tests for functional hearing loss were performed.

TABLE 1. Summary of audiometric findings for types of clinical population.

Case	*Sex*	*Age*	*Air (500-2000 cps) (db)*	*Bone (db)*	*SRT (db)*	*PB (%)*	*Diagnostic Category**
I.	M	45	66	48	78	86	P.M.
II.	M	30	35	35	55	92	P.M.
III.	F	37	50	42	78	16	D.M.
IV.	F	9	63	NR	90	44	D.M.
V.	F	33	52	36	68	NR	D.M.
VI.	F	52	95	43	NR	NR	D.M.

**P.M.* refers to possible mumps while *D.M.* refers to definite mumps.

All of the patients gave negative responses on the Doerfler-Stewart and Delayed Sidetone tests. Electrodermal tests were administered to three of the patients, and the results were similar to those obtained on the conventional pure-tone tests. The various audiometric test results are listed in Table 1.

Discussion

The unique audiometric patterns exhibited by these patients would at first glance give the audiologist cause to suspect the presence of a possible functional hearing loss. However, these patients gave negative responses to tests for functional hearing loss. The pattern of responses for these patients was a typical one. Bone-conduction thresholds were characteristically better than air-conduction thresholds, speech reception thresholds were much higher than the average pure-tone loss, discrimination scores were very low and patients gave indications of recruitment. All of these patterns occurred for the cases giving definite indications of mumps. However, in the 'possible' mumps cases recruitment did not occur, discrimination scores were high and one of the cases obtained bone-conduction thresholds similar to the air-conduction thresholds. Of some interest is the fact that all of the definite mumps patients were female. As can be seen from Table 1, the cases ranged in age from nine to 52 years and all but one were over 30 years of age.

It is very necessary to test these patients immediately upon the onset of hearing loss. The recovery that normally occurs tends to negate many of the typical test responses. The presence of clinical mumps appears to bring about a reversible inner ear type of involvement. It is difficult to postulate the exact means by which mumps produce this temporary inner ear involvement and apparently there are no published reports concerning post-mortem examinations of such patients. Typically, such a type of hearing loss has been attributed to vascular accidents affecting the internal auditory artery or to psychological factors. However, the results of this study appear to indicate that the audiologist should take a more searching look at cases exhibiting sudden unilateral hearing loss. Such patients should be administered serologic tests as part of the diagnostic workup. Also, repeated audiometric studies should be performed over a period of several months in order to ascertain whether there is any recovery of hearing function. Such an audiometric workup

would be necessary before a rehabilitative program could be planned.

The need for further research is indicated especially in terms of obtaining a much more representative sample of this particular type of clinical population. It also appears that the audiologist must become more aware of appropriate follow-up procedures for the sudden unilateral type of hearing loss.

Summary

A battery of audiometric tests was administerd to six cases exhibiting clinical mumps without parotitis. Of these cases four had definite indications of mumps while the other two probably had mumps. A typical pattern of audiometric test responses was obtained for these cases. For those patients giving definite indications of mumps, bone-conduction thresholds were characteristically lower than air-conduction thresholds, speech reception thresholds were much higher than the average pure-tone loss, discrimination scores were very low and there were indications of recruitment. In the instance of the 'possible' mumps cases recruitment did not occur, discrimination scores were high and one of the cases obtained bone-conduction thresholds similar to the air-conduction thresholds.

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Literature Survey Of Growth And Developmental Factors In Articulatory Maturation

Rodney W. Everhart

Articulatory patterns of speech develop as one aspect of the psychophysical systems encompassing total growth and development of an individual in conjunction with maturation and learning. Articulation is dependent upon a continuous process of development from a simple and homogeneous medium to a highly complex, modified and differentiated level of growth. As a child matures, he must endeavor to make a fundamental adjustment to his intrinsic and extrinsic environments, regardless of what prospects they hold in store for him. Whether or not the child develops acceptable patterns of articulation depends upon numerous complex and multidimensional elements. In the final analysis, it is not practicable to relegate articulatory maturation to any one single variate of growth and development. Actually, competency in articulation seems to focus upon the extent to which all developmental propensities contribute to the eventuation of speech out of the psychophysical systems inherent in the human organism.

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The maturation of articulation in many children does not proceed in an orderly cycle, but is subjected to various disturbances imposed by individual deviations in sequence, rate and pattern of growth and development. A few investigations during the past 30 years have been concerned with the relationship between articulatory maturation and other variates such as chronological age, intelligence, reading, retarded physical development, sex differences, handedness and race. Wherever feasible, the writer has included studies reporting any existing correlations between speech aberrations and language development in general to the above stated influences. It is felt that this is permissible if the reader interprets the terms 'speech' and 'language' as including the maturation of articulation. Some of the important findings have been summarized below.

Chronological Age

It is very evident that a normal child has a progressively greater command of the speech process as he grows older (*13*). Indeed, chronological age has a decided influence over the neuromuscular mechanisms involved in producing the finely coordinated movements necessary for acceptable patterns of articulation. It reinforces the child's nervous system

in such a way as to reduce the more generalized biological functions of the peripheral speech mechanism to the highly specialized movements involved in producing the articulatory patterns of speech. This fact was corroborated by Wellman, Case, Mengert and Bradbury (*30*) in 1931, when they gave an articulatory test consisting of 133 speech sounds, including vowels, consonantal elements, consonants and diphthongs, to 204 preschool children. The purpose was to determine each child's ability to use correct sounds in words, phrases or conversational speech which was elicited in response to questions about pictures. The results indicated that there was a rapid improvement with an increase in age in the ability of children to produce English sounds.

Roe and Milisen (*19*) offered further confirmation when they reported that the mean number of articulatory deviations decreased as the grade level increased. The only exception to this was the sixth grade where there was a slight increase, probably due to the selectivity of sampling. They noted a significant difference between the mean number of sound errors in grades one and two, two and three, and three and four. This difference suggests that increased growth and development eliminates articulatory errors in these grades. The absence of a significant difference in the mean number of dyslalic mistakes between grades four and five, five and six, indicates that maturation does not result in any noticeable improvement in the speech sounds of higher grades. This was also apparent in the fact that many defects of articulation still persisted in the fifth and sixth grades.

Poole (*18*) made a study of the relationship of consonant sounds to genetic development. She administered an articulation test and found that chronological age, intelligence and social contacts with other children decidedly influence a child's ability to articulate consonant sounds. Consequently, it must be recognized that chronological age alone is not the sole criterion for developing articulatory patterns of speech within the normal range. The maturation of the complex structures necessary for articulation is intricately related to the development of intelligence among other factors.

Intelligence

It has become an established fact that intelligence plays a significant role in the development of the highly specialized movements involved in articulation. A child possessing a good intellectual capacity has innumerable advantages over the child with low intelligence. His ability to meet new situations quickly and successfully and his power to apprehend the interrelationships existing in his psychosocial systems are distinct attributes.

Some investigators have observed a positive correlation between the factor of low intelligence and the incidence of articulatory disorders. Mead (*14*), McCarthy (*13*), Smith (*23*) and Town (*26*) have reported a direct relationship between mental retardation and speech handicaps (including defective articulation). On the basis of the Kuhlmann Test of Mental Development, Spiker and Irwin (*24*) demonstrated a reliable relationship between the abilities measured by this scale and certain aspects of infant speech sound maturation. Beckey (*3*) found in her study of certain factors related to retardation of speech that children with delayed speech tend to be inferior in intelligence as compared

to children exhibiting normal patterns of speech.

In 1938, Hall (*10*) published a research report dealing with both college and elementary school children. She discovered that auditory memory span for the phonetic elements seemed to be associated with intelligence. She hypothesized:

> Results found in the past of auditory memory span (*i.e.*, positive correlation between auditory memory span and speech defects) were probably due to the differences in general intelligence in which auditory memory span is a factor, rather than to a specific disability in this trait.

If this finding is acceptable, it would further substantiate the thesis that the incidence of articulatory defectiveness is greater in children of retarded mental development than among normal speaking children.

Gens (*8*) makes a conjecture that seems to offer an additional confirmation of the role of intelligence in the maturation of articulation. It is his impression that delayed speech may be attributable to a lack of mental ability. He concludes that in general one-tenth of the children enrolled in public schools and three-fourths of the mentally deficient children have speech disorders as a result of inferior intelligence.

Bangs (*2*) and Voelker (*28*) opine that feeble-minded individuals exhibit more articulatory defects than those of normal intelligence. However, many feeble-minded adults with mental ages of seven or more are able to speak with few articulatory errors. Therefore, we can ask, is intelligence the primary factor inherent in the incidence of defective articulation, or does it merely enhance other growth and developmental factors that might be involved?

Sirkin and Lyons (*21*) examined 2500 institutionalized mental defectives and discovered that only one-third of the individuals studied had speech within the normal range. They concluded that the lower the intelligence rating, the lower the incidence of normal speech.

The same relationships were observed when Davis (*4*) and Day (*5*) traced the relationship of chronological age to mental age in mental defectives. These studies compare favorably to those of Sirkin and Lyons (*21*), who pointed out that a definite parallel exists between intellectual capacity and defective speech.

Reading

An investigation of research reports indicates an absence of complete agreement as to the relationship of reading defects to articulatory aberrations. Nevertheless, in considering this question an attempt was made to appraise the literature to account for whatever correlation appears to exist.

At the outset, one is confronted with two aspects of the problem that need to be differentiated. The first is concerned with the maturation of articulation in a background devoid of meaningful experiences. Any limitation in real or vicarious experiences, with their concomitant limitations in word meaning and articulatory fluency could peradventure have a bearing upon reading ability. This holds true if reading is interpreted to be a process of reconstructing facts based upon visual symbols. The second deals with a subsidiary part of the problem, that of the relation between the inability to produce the correct speech sounds and reading ability. This discussion has been concerned mainly with the second aspect of the problem, as it appears to coincide more

concretely with the intent of this paper.

Speech and reading are inextricably associated in the process known as communication or language. Any limitation or facility in one is directly reflected to some degree in the other. Researchers in the field have long since given up looking for a single factor that would explain and account for reading handicaps. On the contrary, they have concluded that reading difficulties as well as other factors involved in the language process could be attributed to a multiplicity of interrelated factors. Such factors which may render reading particularly effective on the one hand and impotent on the other include inferior instructional materials, absence of motivation, visual or auditory handicaps, articulatory defects, and irregular patterns of growth and development.

Hildreth (*11*) mentioned a number of language handicaps that could contribute to reading retardation. She listed along with other factors inadequate or immature motor coordination in articulation, indistinct or inaccurate articulation, and poor auditory discrimination of speech sounds.

Jackson (*12*) compared approximately 300 advanced readers with a similar number of retarded readers in grades two through four in order to determine psychological, social and environmental differences between advanced and retarded readers. His findings indicated that 10 per cent of the accelerated readers and 23 per cent of the retarded readers possessed speech defects. In this connection, he revealed that a critical ratio of 3.66 had been established, which designates this frequency to be above the expected rate due to chance.

Thirty-six matched pairs of children were used by Moss (*16*) in her study to determine the influence of speech defects on reading achievement. One child from each pair had a speech defect, while the other possessed speech within the normal range. The Grey Standardized Oral Reading Test was utilized to check reading ability. It was found that children with normal speech surpassed the children with defective speech, in both speed of reading and freedom from reading errors. She also discovered that the average child with a speech deviation required 8.7 seconds longer to read a given selection and that he made 1.8 more errors on a given page than the average child having normal speech. These findings tend to suggest the possibility of interlaced growth and developmental factors which influence performance in both speech and reading. Specifically, the speed of reading and the frequency of reading errors could be directly influenced by articulatory disability.

Artley (*1*) has discussed selected research which indicates that a definite relationship exists between speech difficulties and deficiencies in reading ability, though there is a lack of agreement as to the extent of this relationship. He points out that where speech handicaps exist as a cause of oral reading defects, an explanation may lie in the fact, among other things, that articulatory deviations could result in errors of pronunciation which would have an effect upon the standard of interpretation.

In a comprehensive and analytical investigation completed by Yedinack (*31*), children with functional articulatory disorders, reading disabilities, or both, were located in the second grade of 10 public school systems. Forty-two cases of defective articulation, 35 reading handicapped cases, 27 articulation-reading disability cases,

and 74 control cases were selected after extensive reading, speech and intelligence testing. A significant relationship was observed in both oral and silent reading between children with functional articulatory deviations and children having normal speaking ability. Also, she pointed out that children with reading disability frequently have articulatory handicaps.

No doubt many factors other than those considered in this discussion may have an etiological relationship to reading and articulatory problems. Obviously the final word has not been written. In the author's opinion, further research in the relationship of various growth and developmental factors will undoubtedly shed additional light on both diagnosis and therapy.

Retarded Physical Development

The accumulated research reports tend to establish that a well-organized knowledge of delayed physical growth and development to articulatory maturation is appallingly lacking. However, it is felt that an inquiry into the available investigations would profitably contribute to an additional understanding of factors which could affect articulatory growth and development.

Mead (*14*) reported a correlation between rate of physical growth and speech maturation. The results pointed out that children deficient in linguistic development and intelligence were two months slower in learning to walk when compared with children from the normal group.

These observations were further borne out by Beckey (*3*) in a study conducted to determine the relationship of certain factors to speech retardation. She noted a delayed maturation of the larger muscular mechanisms necessary for walking, until after the fifteenth month in a significant number of children possessing language handicaps. Her data also showed that the group of children with delayed speech development had tendencies toward slow dental growth and late voluntary control of bladder and bowels. This fact indicates that speech does not develop until sufficient maturation has been attained by the large muscular mechanisms.

Van Riper (*27*) also found a definite connection between retarded physical growth and speech maturation. His findings indicated that 35 per cent of the cases studied were slow in dental, physical or coordinated development.

Here again it is impossible to divorce the factor of intelligence from physical growth and development. While there is overlapping with other groups, there is a strong tendency for the child with 'good intelligence' to excel other groups in such physical factors as height and weight, breathing capacity, strength of muscles and grip. Also, there is some evidence to indicate that they walk and talk at earlier ages. Naturally, the sequence, rate and pattern of physical growth and development is dependent upon a favorable environment. Without a desirable milieu, the child's timetable for physical development can be disturbed and result in distortions of his unfolding design.

Therefore, if we assume that articulation is an individuation out of organismic growth and development, it becomes immediately apparent that retarded physical development and inferior intelligence could appreciably impede articulatory maturation. This is especially true if we accept the theses that articulation does not de-

velop until a certain degree of intellectual growth has been attained and until the large muscular mechanisms have matured.

Sex Differences

Sex appears to have an important bearing upon the growth and development of articulation in children. Consistent findings have emerged to date that reveal positive differences in favor of girls in almost every aspect of linguistic development. Many observers report that whenever groups of boys and girls are matched according to well-defined variables, there seems to be a more rapid rate of language development (including articulatory maturation) in girls. In rare instances these sex differences are reversed or fail to appear. Ostensibly, this can be attributed to poor sampling and the failure to consider adequately certain primary factors.

McCarthy (*13*) and Smith (*22*) have postulated that linguistic development is more rapid in girls than in boys, in extent of vocabulary, in the age at which short sentences are used and in comprehensibility of their speech at early ages. In a careful study Wellman and others (*30*) observed that girls tend to articulate consonant sounds earlier and more accurately than boys.

Poole (*18*), in a doctoral dissertation completed in 1934, reported a comparable rate of development in articulatory efficiency in boys and girls from two and one-half to five and one-half years of age. After the five and one-half year level, girls tend to display more rapid growth as pointed out by zero scores on the articulation test. She also indicated that girls approach articulatory efficiency at six and one-half years while boys usually require another year to attain the same degree of proficiency.

The greater incidence of articulatory defectiveness in boys can no doubt be accounted for in part by the fact that the growth and development of boys is generally slower when compared with girls of the same chronological age. The more frequent occurrence of articulatory and speech deviations among males can be noted in practically every study; however, the sex ratio reported among children with articulatory handicaps varies.

Morris (*15*) made a speech survey of 208 pupils enrolled in grades 3A to 7A of the Laboratory School at Indiana State Teachers College. He reported a higher incidence of articulatory defects in boys than in girls.

Root (*20*) discovered the ratio of boys to girls with speech handicaps to be one and five-tenths to one when he sent out a questionnaire to determine whether speech difficulties presented a problem in the public schools of South Dakota. Judgment as to who were speech deviates was made from definitions of different disorders on the questionnaire.

A similar speech survey was conducted in 1916 by Wallin (*29*) of 89,057 students in the public schools of St. Louis. These children ranged in chronological age from five to 21 years. The ratio between boys and girls demonstrating speech disorders was set at two to one.

The extent to which articulatory development is innately connected with sex differences remains open to question. We must consider the effect of given dissimilarities in social stimulation.

Handedness

Several investigations have been conducted to determine the relation-

ship between handedness and speech aberrations. The results of most of these studies are inconclusive and questionable. However, it is generally believed that children with speech disabilities tend to lack hand preference.

This assumption was substantiated by Nice (*17*), who discovered seven cases of delayed speech in which ambidextrous tendencies seemed to be a constant factor. Beckey (*3*) also reported that the delayed speech group utilized in her study tended to be somewhat more ambidextrous than the control group. Data for her investigation were secured from statements made by parents as to the handedness of each child studied. No handedness tests were actually administered. This fact considered alone could detract appreciably from the validity of the results subsequently obtained.

The above quoted studies are concerned chiefly with the relationship of handedness to idiolalia (retarded speech). It should be stressed that a child with delayed speech usually has many other difficulties along with a severe dyslalic condition. These children frequently lack hand preference and are often handicapped linguistically and semantically. They lack ability in the basic use of the articulators and general over-all speech skill.

The reader is reminded that children exhibiting the common disorders found in the public school do not necessarily display the conditions stated above. Rather, their misarticulations generally consist of sound substitutions, omissions and distortions, without any notable language handicap. However, it is felt that the two types of speech disorders can be considered conjunctively here, if defective articulation is used as the common denominator.

Certain investigations in aphasia have demonstrated that the portion of the brain which controls speech is directly related to the hand preference. Therefore, it is logical to assume that confused cortical laterality could have a pronounced effect on the maturation of articulation and speech in general. This hypothesis is based upon the fact that often miraculous results seem to follow a program of remedial therapy in which stress is placed upon manual activity and motor skills to establish hand preference.

In conclusion, it is felt that ambidextrous tendency and the occurrence of defective articulation may be part and parcel of the same basic phenomenon evolving out of organismic growth and development. If this relationship does exist, however, it is probably only an indirect one.

Race

In presenting a discussion on the subject of race, the reader should keep in mind that this section of the paper is concerned almost solely with the Negro and white racial groups. Therefore, the term race as used in this discourse will be interpreted on this basis.

To date, no data have been advanced which study the relationship of race to factors of growth and development and articulatory maturation. The studies reported during the past 30 years are only remotely allied with the purposes of this article. The writer has endeavored to arrive at some tentative suppositions as to the possible influence of race on the unfolding design inherent in the maturation of the articulatory patterns of speech. This has been done on the basis of the related literature.

An early racial study was made in 1917 by Sunne (*25*) on 126 Negroes and 112 whites in New Orleans with the Binet and Yerkes Point Scale. The report of this investigation showed the whites to be one year older in mental age than the Negroes of the same chronological age level.

A later investigation of Negro-white differences of mental ability in the United States conducted by Garrett (7) also revealed that the American Negro on the average ranks consistently lower than American whites on tests of mental ability. He pointed out that the regularity of data from babyhood to adulthood makes it extremely unlikely that environmental opportunities could possibly explain all the differences found. However, his investigation did not sufficiently explain the differences between American Negroes, Northern and Southern, and whites. It is felt that the national norms established for different tests of intelligence would not always take cognizance of the significant and constant differences existing between given racial and cultural groups. Therefore, the validity of this investigation is to be questioned.

In an investigation reported by Goodenough (*9*), she pointed out that most psychologists are satisfied with the disproof of the exorbitant claims of racial differences which have been made. In short, they are willing to objectively accept or reject certain racial differences in the light of available data. On the other hand, some psychologists have stalwartly recognized certain racial differences, regardless of the accessible information refuting their claims.

Other studies could be cited accepting or rejecting hypotheses laying claim to various racial differences. The writer did not feel that they would contribute appreciably to an understanding of the relationship of race to factors of growth and development and the maturation of articulation. Further, the validity and reliability can and should be questioned in many of the investigations conducted in the past. An attempt has been made in the succeeding lines to elucidate some assumptions that seem to make their appearance from the above survey of literature.

Doubtlessly, racial groups may show differences in native endowment. The question might be posed, do these differences arise from the physical basis of race, or are they allied with varying cultural distinctions? Thus, it is suspected that no substantial tests have been devised for determining mental traits of races. The current examinations fail to consider that habits and customs of one group might not indicate the status quo of another. We shall not be able to demonstrate that one race is intellectually superior to another until a test of mental ability is devised which measures 'pure native endowment.'

Obviously, a tremendous amount of work remains to be done in this unscratched field. Innumerable possibilities lie in store for research workers interested in exploring racial differences in the maturation of articulation from the viewpoint of growth and development. Unfortunately, past research has concerned itself almost exclusively with only comparing the racial groups on the basis of intelligence. The relationship of race to other growth and developmental factors has been markedly neglected. Possibly this can be attributed to the lack of scientific measuring devices.

Summary

A prodigious amount of literature has accumulated during the past few years regarding the articulatory defective child. The lapse of time has produced innumerable conjectures and many theories relevant to etiology which seem to govern our present day thought and practice. Unfortunately, available research reports disclose only meager data relevant to the relationship between certain growth and developmental variables and articulation.

Current literature increasingly stresses the necessity of sound differential diagnosis in order to insure the ultimate success of a remedial speech program. On the basis of this observation alone, the importance of knowing the role of growth and development in the maturation of articulation can hardly be questioned. This would seem to be particularly true if one accepts the thesis that if the child is viewed as a whole, an underlying unity is discovered in the individuation of structures, functions and achievement out of total growth and development.

Many other growth and developmental factors in addition to those presented in this discussion may have an etiological influence upon articulatory maturation. A consideration of such variables as motor coordination, neurological impairment, bilingual background, birth injuries, and psychological orientation offer future research possibilities in enriching the present store of knowledge.

The review of literature cited in this paper tends to suggest certain conclusions and questions worthy of consideration in the light of future therapy and investigation.

1. There appears to be a positive correlation existing between the factor of low intelligence and the incidence of articulatory disorders.

2. Increasing chronological age assists in the refinement of the neurophysiological mechanisms needed to develop articulatory competency. Is it conceivable that many children now receiving speech correction in the early elementary grades would outgrow their articulatory defects without benefit of formal training? Perhaps speech improvement classes along with the 'maturational effect' would suffice.

3. Reading and articulatory maturation appear to be inextricably associated as parts of the linguistic function. There is absence of agreement as to the extent of this relationship. The phonic and phonetic elements involved in articulatory production and word attack in reading could be employed as a common denominator to both.

4. According to Everhart (*6*), no significant differences were discovered between Negro and white boys having dyslalia in respect to the incipiencies of holding head up, crawling, walking, talking, eruption of first tooth, height, weight, intelligence, reading and arithmetic. Real differences seemed to exist in the case of onset of sitting alone and voluntary control of the bladder. The differences noted favored the Negro boys with respect to onset of sitting alone and white boys for voluntary control of the bladder. For grip, Negro and white boys possessing articulatory handicaps revealed a significance level tending to denote a possible difference. Nonsignificant differences were apparent for the above listed factors when Negro and white girls with dyslalia were compared. Experimental verification with a larger sample size would be desirable. Certainly, there is need

for similar research encompassing other racial groups.

5. Statistics show that articulatory defects are more prevalent among boys than girls. Generally, this finding tends to be reflected in the total linguistic performance of boys and girls. Perhaps this bit of logic should receive due emphasis in the therapy implemented for the different sexes.

6. In some instances, articulatory difficulty may be caused by a failure to establish unilateral dominance in the cerebral hemispheres. Confused laterality could be a manifestation of the total articulatory problem, especially if we subscribe to the assumption that conflict between the hemispheres reduces the control of the mid-line organs used in the production of the speech sounds. There is need for more extensive investigations of this possibility.

7. Most authorities feel that speech generally does not develop until the large muscular mechanisms have matured sufficiently. Retarded physical development in conjunction with inferior intelligence could restrict articulatory ability.

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Bridging The Gap

George A. Kopp

I have looked forward to this occasion with conflicting thoughts and feelings. It marks the beginning of the end of 14 years of continuous service with you and for you in behalf of our association. During these years you have placed many 'hats' of responsibility on my head and you have awarded me every honor within your power to give. As I near the end of the road, I look backward with feelings of both pride and humility: pride in what you have accomplished and the part you have permitted me to share with you; humility for the assignments that are still unfulfilled. I look forward with confidence that the future of our association will be even greater than its past. Personally, I shall welcome the opportunity to devote a little time to research, writing and recreation.

Tonight I wish to review with you some of the important determinants of the professional climate we have created for ourselves. I wish to make an operational analysis of us as professional people, our objectives, the knowledge and materials we use in pursuit of our objectives, where we obtain our training and where we are employed in using it. On the basis of this first analysis of what we are, what we do and where we do it, I wish to make a second operational analysis of our association including its membership, certification, ethical practices and the American Boards of Examiners in Speech Pathology and Audiology. In this context I found the title of my talk—'Bridging the Gap.'

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Operational Analysis of Membership

Professional Objective. The purpose of our existence as a professional and learned group has remained constant. Stated in the simplest terms, our individual and collective endeavors are directly or indirectly concerned with helping individuals who have speech or hearing handicaps. This is the construct, the heart, the core of all of our activities. Our goal has been and continues to be a positive one. Our services are unique and they meet a need that was neither recognized nor met by any other professional group. The apparent dualistic nature of our objective—helping the speech or hearing handicapped—is not divisive. Speech and hearing are neurologically and psychophysiologically so highly integrated and interrelated that they are recognized and accepted as being interdependent aspects of oral communication. So long as the two processes remain structurally and functionally united in the human organism, those of us who work with the speech or hearing handicapped can function optimally only if we continue to work together.

Academic and Professional Knowl-

edge. Next, I wish to apply the technique of operational analysis to the knowledge we use in obtaining our objectives. We have taken information from many fields of learning. We have synthesized, modified and applied such knowledge for the purpose of helping those with speech and hearing handicaps. The content of our basic courses include a synthesis of anatomy, neurology, physiology, psychiatry, endocrinology, biochemistry, physics, mathematics, psychology, sociology, education, linguistics, anthropology, English, statistics, music and speech. The resulting body of knowledge, plus the contributions made to it by researchers in speech pathology and audiology, and the voluminous contributions made by graduate students have been organized in unique and specialized curriculums that have been established in American education. Today, the volume of knowledge is so great that most of the larger training centers offer curriculums that lead to the bachelor's, master's and doctor's degrees. It is almost unbelievable that practically all of this growth has taken place within one generation of teachers, scholars and researchers. It is interesting that although curriculums on college and university levels provide information and skills to be taught in public schools, we do not have a generally accepted series of progressive textbooks in the essential skills of speaking and listening comparable to those used in reading, written language and arithmetic. However, our greatest need in respect to academic and professional knowledge is to make the professional courses that deal with the application of information comparable in quality to the academic courses that provide the information to be taught. Our methodology has been developed with little benefit of experience in other fields that could be synthesized. Because this is true, the professional aspect of our knowledge becomes the greatest challenge to our intelligence, research skills, inventiveness and imagination.

Training Centers. All of us recognize that the curriculums offered in our training centers vary with the professional background and philosophy of the staff and the college in which the program is offered.

At College A, the director in charge of the speech and hearing program may conceive of his responsibility as that of training students to work only with defects of articulation. Emphasis is placed on elementary correction, phonetics and methodology. A student may graduate with no training in the basic sciences, little or no ability to make a valid diagnosis, and questionable competence in working with the organic disorders.

At College B, the director in charge may have sufficient staff and financial support to require that his students study the basic sciences, methods of diagnosis and methods of treatment for most types of speech or hearing disorders. If he is fortunate in his location, he provides his students with varied case load for their clinical practicum.

At University C, a student in Liberal Arts may obtain his bachelor's, master's and doctor's degrees without being exposed to a course in education. He may be employed on a university staff and be given the responsibility of training teachers in speech correction and hearing even though he himself has never had a course in Philosophy of Education, Educational Psychology—the learning process, or Methods of Teaching. Such a person would be trained, but not to teach.

At University D, a student in the

College of Education may obtain his undergraduate and advanced degrees without exposure to the basic sciences and humanities. Such a person would be trained in specific methodology but would be seriously limited in respect to both values and information essential to a profound pursuit of his profession.

Each of these four illustrations is a somewhat exaggerated example of a variety of existing curriculums with which we are all familiar. Although each curriculum may be vigorously defended by its proponents or condemned by its opponents, the ASHA has no jurisdictional right either to approve or to disapprove. Our professional responsibility is to establish a series of model curriculums that, when taken, will provide various levels of competencies. We need to designate these competencies and to encourage state departments of education to incorporate both the designations and the curriculums in their certification requirements.

What We Do and Where We Do It. Operationally we are a complex group. I want to postulate that our greatest strength and basis for unity may be found in our complexity. An operational analysis reveals that most of us are teachers. We are employed as teachers and our primary responsibility is the training of teachers. I include the majority of clinicians in my concept because I believe that most clinicians teach something to the children or adults with whom they work. An important minority of nonteaching personnel work as diagnosticians, technical experts and researchers of various kinds. Even though they are not teaching, they provide information and perform services that are basic to effective teaching. These are the things we do as professional people. We teach in public schools, in colleges, universities, institutes or in other institutions and facilities. We teach in classrooms, clinics and private studios. We teach individuals and groups. We make diagnoses or evaluations of speech and hearing that are basic to the instruction provided. We build and maintain equipment used in diagnostic and therapeutic procedures and in research. We pursue research to extend our knowledge and to improve our competencies.

I want to add that we should take pride in being what we are. There are centuries of prestige and dignity associated with the profession of teaching. Education is the master or parent profession of all other professions. For many of us it is and should be our professional designation. The scientists, researchers and technological experts among us work with varied affiliations to construct the base of our professional existence. They are not clinicians. The continued effort to designate all of us as clinicians and all of our services as paramedical, ancillary medical and clinical, places us in a subordinate and subservient position to our medical colleagues and to other professional groups. Also, it puts many of us into a position of being something that we do not want to be because we cannot nurture our learned and scientific heritage in a field of clinical work.

Operational Analysis of ASHA

Next, I wish to apply the operational analysis technique to our organizational structure and function. The dynamics of our complex system are reflected in changes in every aspect of the association. In fact, expectancy of change has become a characteristic of ASHA members. We have one

convention a year and every member knows that we do our best to continue the unbroken chain of changes.

Name of Association. There is nothing unique about the four names we have had since 1925. The fact has been printed in the annual directory for years. Everyone should know that we started our professional life as the American Academy of Speech Correction. We changed our name in 1927 to the American Society for the Study of Disorders of Speech. By 1934 there was some question about the word 'Society' and there was proof that the members did something besides study the 'Disorders of Speech.' The name was changed in 1934 to the American Speech Correction Association. This continued to be our title until 1948 when we appropriately and accurately became the American Speech and Hearing Association. My purpose in mentioning our changes in name is to call attention to the fact that it took us from 1925 to 1948 to get both the sensory and motor (receptive and expressive) divisions of our professional enterprise into our title. To fully appreciate the significance of our 23 years of name changing, you must know that 30 years ago students in speech pathology devoted almost as much time to studying hearing as they did speech. There has been an increasing emphasis on hearing through the years. The implication is clear. If we have enough time, we will evolve enough changes to make our association representative of what we are. I am sure that you realize that we do not have 23 years to solve some of the other problems that are before us.

Membership. Next, I wish to consider with you our membership structure. From 1926 through 1942 there were two types of membership; Fellows and Associates. There were 19 Fellows and three Associates in 1926, and in 1942 there were 72 Fellows and 409 Associates. Note that there were more than five times as many Associates as there were Fellows. In 1943, the classification was changed to include: Fellows, Professional, Clinical, Technological, and Research Members and Associates. There were 73 Fellows, 13 Professional and five Clinical Members, plus 496 Associates. In 1948, the year I became your Secretary-Treasurer, there were 541 Members (Fellows, Professional and Clinical) and 603 Associates. In 1950, the last year that we had this classification, there were 98 Fellows, 147 Professional and 566 Clinical Members, plus 812 Associates, making a total of 1623, half of which were Associates. In 1951, we started the classification used today, including two types of membership, Members and Associates. In 1951, there were 1070 Members and 780 Associates, making a total of 1859. This year, 1959, our total membership is over 5000. The rapid increase in membership began in 1951, concomitant with the separation of membership qualification and certification requirements.

My purpose in mentioning all of these membership figures is twofold: (1) Note the change in our membership structure. During the first 16 years the Fellows were in complete control of the association. During these 16 years only 53 Fellows were approved for membership. We had an aristocratic, elite and proud membership, made up of peers in our academic and professional field. In 1943, with the change in membership classification, there were five clinical members. In 1950, there were 566 clinical members. This year, 1959, even though we have not had clinical

members as such since 1951, all of us who are certified are, by implication, clinicians.

(2) I call your attention to the obvious fact that every member has equal franchise. We have nominations from the floor and mail ballot. Therefore, if the members from tangent areas ever outnumber those from speech and hearing, the professional identity of our association may be changed. This is possible under our existing by-laws. Our membership structure is the principal determinant of what we are today and what we may be in the future. By the simple process of nominating and electing officers and councilmen, control of the association is maintained by the membership.

Clinical Certification. In my opinion, the most significant change we have ever made in our association was the separation of requirements for Membership and Certification in 1950. In this reorganization the Advisory Committees on Speech and Hearing and the Committees on Academic and Professional Preparation and Credentials were replaced by the Standards Committees in Speech and Hearing, the Clinical Certification Committee and the Membership Committee. Specific provisions were made to effect the transfer of Fellows, Professional, Clinical, Technological, Research Members and Associates. The plan included an automatic certification procedure and the retention of Fellow as an Honorary designation. The voluntary change of status of the Fellows of the Association is worthy of comment; but my primary purpose here is to call your attention to how completely we broke away from the traditional academic, professional and educational determinants of the past. Our professional orientation became clinical in nature. We established Clinical Certification with recommended groups of courses with a studious omission of basic courses in education, including practice teaching. Yet, our certification requirements for Clinical Certification have been used by many states in establishing certification for public school speech correction teachers. Not a single state, so far as I know, certifies clinicians in speech pathology or audiology. In our attempt to make clinicians out of teachers, scientists, researchers, and technological experts, by providing only clinical certification we added to, or perhaps we caused, the confusion that makes it impossible to decide on designations for ourselves and the work we do. Our pupils are supposed to be patients or cases. We practice in preference to teaching. We speak in terms of case load, not class size. These things we do so that a few of us may be appointed as technicians or therapists in a medically oriented facility where an M.D. makes the speech diagnosis and prescribes the therapy to be used.

I suggest that the time is opportune for us to institute a multifaceted certification plan that will provide a certificate of competency for all of our members who are trained to work in clinics or public schools. Requirements for certification for each category, where certification is indicated, should be a model that could be used by any state without modification. If we do not do this soon, one or another organization will do it for us.

Those of us who are not clinicians would welcome the opportunity of being identified and designated for what we are, educators, teachers, technologists, scientists or researchers. The image of ourselves must be a total and not a partial one.

As all of you know, every state has

a department of education that certifies teachers of various kinds. With the House of State Delegates a near reality, we have direct lines of communication to help unify and upgrade state certification requirements in speech and hearing. We have an opportunity to designate our classroom and clinical work as educational and, as such, make it subject to the laws of education in the various states. This could be an important consideration in the market place for our services. To employ a therapist or a technician in speech and hearing on a staff of other therapists or technicians is the prevailing practice in rehabilitation institutes and other medically oriented centers. To establish a training facility with certified teachers places the activity under school law. Our leadership and guidance in this important area have been restricted and circumscribed by the clinical concept and clinical certification to the exclusion of values inherent in education.

Furthermore, I wish to stress the fact that state certification and regulation could provide complete coverage of all personnel working with speech and hearing handicapped. Regulation of professional activities through the ASHA is limited mostly to members. We are helpless in dealing with nonmembers. The activities of a few unethical individuals can degrade the profession in any community. Uniform regulations that apply to everyone working with the speech and hearing handicapped can be established only through the state departments.

The need to become a licensed professional group is becoming greater every year. But before we undertake to solve this important problem, we should reconstruct our certification procedures (1) to provide certification for all of our academic and professional members on the bases of what we are and what we do; (2) to provide appropriate designations to be used with the terms 'Basic' and 'Advanced'; and (3) to standardize and unify the certification requirements used in different states in order to regulate the nonmembers who work with the speech and hearing handicapped.

Ethical Practice. The work of our Committee on Ethical Practice is determined by what we profess to be within the framework of our professional and learned activities. If we continue to think of our work as practice and the people with whom we work as patients, then in order to safeguard the well-being of our patients who suffer with speech and hearing handicaps, we must police ourselves. We cannot police nonmembers; so all anyone has to do who is guilty of malpractice is to stay a nonmember. We are now committed to gathering evidence, preferring charges, producing witnesses and holding a court of trial. The severest punishment possible to administer is to drop the individual from membership. This frees the person from the embarrassment of further accusations and permits him to continue as before. It also provides him with a possible legal recourse that is not pleasant to contemplate.

It seems to me that our Code of Ethical Practice, like Clinical Certification, has been confined and limited by the concept that we are all clinicians. The code was not written, nor has it been revised, to encompass those of us who are not clinicians. Perhaps the clinical code would apply to the educator; but its application to the scientists, researchers and technologists

is questionable. We need a Code of Ethical Practice that covers the activities of each of us. Also, it would seem to be to our advantage to make use of any or all existing state laws that pertain to our field and to encourage new laws where necessary. State school laws offer a long established system of regulation and control. Violations, if any, would be of a state law as well as of a code of conduct of our National Association. The coverage would include persons who are not members of the ASHA. I firmly believe that the police method of enforcing our Code of Ethical Practice should be replaced by educational procedures to solve problems of unethical conduct.

American Boards of Examiners. Finally, I come to the last major determinant of our professional climate. I hesitate to mention it because it has not, as yet, become effective. However, our built-in potential for positive and constructive change is unlimited. I am speaking of the establishment of the corporation entitled American Boards of Examiners in Speech Pathology and Audiology. The membership approved this corporation by an overwhelming majority vote which indicated that you, as well as your Executive Council, recognize the needs for Standards in Clinical Services in Speech Pathology and Audiology, Standards in Education and Training, and for the diplomate level of competency. In consideration of the recommendations made by the group authorized by the Executive Council to proceed with deliberate haste to establish the corporation, the Executive Council approved: (1) that a slate of nominees for the original board of directors of the American Boards of Examiners in Speech Pathology and Audiology be submitted to the membership for advisory vote; (2) that the corporation may be established within the corporate structure of the ASHA, thus assuring the Trustees of the moral, legal and financial support for the responsibilities assigned to them; and (3) that priority of action in establishing the Boards of Examiners be given first to the Standards in Clinical Services in Speech and Audiology, and to Education and Training, and second, to the Board dealing with the Diplomate. With your cooperation and support this significant undertaking will be successful in developing our professional stature through many years to come.

Conclusion

In conclusion, I have presented a subjective operational analysis of us as a professional group and of the association we have established to represent us. The discrepancies between what we are and what we do and what we pretend to be within our association have led to confusion in designation, certification and ethical practice. We must bridge the gap between what we are and what we profess to be in our association. If we are to survive as a self-governing and self-determining professional group, we must provide unambiguous designations, certification, identification, and a Code of Ethics appropriate to each of our varied interests and tasks. It seems imperative that we must agree on a set of values that will give our whole clinical-educational-research venture the status it must have if it is to serve effectively in the united role of aiding the speech and hearing handicapped, wherever they may be located. Finally, our greatest consideration should be, not where we are, but the direction in which we are going.

Formal Call for Papers

The American Speech and Hearing Association

Thirty-sixth Annual Convention

November 1-5, 1960, Statler-Hilton Hotel

Los Angeles, California

All members of the Association wishing to present papers on the program of the National Convention in 1960 are invited to submit abstracts. Consideration will also be given to abstracts from nonmembers.

The deadline for submission of abstracts is April 15; however, speakers are urged to present their abstracts early. This is particularly pertinent in view of the fact that all sections will be limited to a maximum of four speakers. The program committee would also welcome suggestions of a general nature in regard to the program.

All communications including abstracts should be sent to:

Jack L. Bangs, Chairman
Program Committee
Houston Speech and Hearing Center
Texas Medical Center
Houston, Texas

All abstracts must include (1) the title of the paper, (2) last name, initials and advanced degree of all authors with the name of the author actually reporting the paper given first, and (3) the name of the institution or laboratory at which the research was done or with which the author is affiliated, (4) if the work was done under direction as a student, a statement to that effect, (5) a concise summary of the contents including information concerning both problem statement and findings or opinions, and (6) the time required for presentation.

In general, abstracts should not exceed 300 words in length and should not be so brief that they do not do justice to the contributor. It is hoped that the program and abstracts will be published together so it is particularly pertinent that abstracts be complete and in early. All abstracts of accepted papers will be reviewed by a committee and returned for additions or corrections if found inadequate.

Submission of an abstract implies that a contributor accepts the following responsibilities: (1) He must be present in person at the scheduled time. If

unforseen circumstances prevent his appearance, he must make suitable arrangements with his chairman as far in advance as possible. (2) He must keep strictly within the time limits assigned to him by his chairman.

The Executive Council has ruled that each individual be limited to two appearances on the program to insure a wider participation of the membership. This ruling includes the presentation, or co-authoring of a paper, participating on a panel, and the like. It does not, however, limit an individual from serving as a chairman for a particular session.

It is urged that participation not be confined to experimental studies. Theoretical and practical discussion of any phase of the communicative process is welcomed. It is hoped that a large number of abstracts and program ideas will be submitted; careful consideration will be given all of them.

Individuals responsible for such functions as receptions, alumni luncheons, open houses, *etc.*, are invited to submit the essential information to the Program Chairman for inclusion in the Convention Program.

The Program Committee

Victor Garwood
Joseph G. Sheehan
Frederic L. Darley
John W. Black
Dorothy Huntington
Henry E. Spuehler
Newman Guttman
Arthur S. House
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Freeman McConnell
Mack D. Steer
Genevieve Arnold
Janet Jeffers (Film Theatre)
William H. Perkins
William Tiffany
Charles D. Parker
Jack L. Bangs, *Chairman*

Important Notice

November 1, the first day of the Convention, will be devoted exclusively to a Conference on the National Study on Public School Speech and Hearing Services.

A Numerical Measure Of Articulation

Janet O'Neill Barker

The problem of assessing progress of children with articulatory defects has been recognized, but not resolved, in the field of speech therapy. The various types of articulatory disorders, including those of delayed speech, account for about 75 per cent of the total speech defects found among the public school children (*1*). Because there are so many children with defects of articulation, it seems desirable to have some easily interpreted means of relating children's articulation to their communication, that is, to the amount of speech listeners can understand. Methods are available for measuring and assigning scores to such intangible factors as intelligence, personality, attitudes and adjustment; there should also be a way to assign a single, meaningful score to articulation.

Any measure of articulation, whether it is to be used for clinical or research purposes, should fulfill certain criteria: (1) It should include a consideration of all speech sounds—consonants, vowels and diphthongs. (2) It should represent speech adequacy in a quantitative manner. (3) It should be numerically accurate and allow for statistical manipulation. (4) It should be simple and convenient to use. (5) It should be easily interpreted.

Janet O'Neill Barker (M.A., University of Arizona, 1959) based this paper on her M.A. thesis, completed under the direction of Professor James D. Lambert.

Review of Literature

Many people have tried to quantify speech for therapeutic and research purposes. Most of the studies have involved subjective evaluations of defectiveness by observers.

Measurement of Speech. Curry, Kennedy, Wagner and Wilke (*2*) devised a 'product scale' to be used as a basis of comparison for assigning values to articulation. Using the method of paired comparison, observers placed recorded samples of children's speech along a severity continuum. The scale is to be used by assigning to the person being tested the value of the 'product scale' selection most resembling his speech.

When George Shames (*12*) investigated the value of various biographical and personality factors as predictors of success in speech therapy, he asked two speech clinicians to rate the speech of his subjects. The clinicians indicated whether the speech on the second recording presented to them was better than, the same as, or worse than that on the first recording. The correlation between the judgments of the two clinicians was .57.

Several studies using judges' ratings of recorded speech have been done at Ohio State University. These judges were trained according to the methods determined by Morrison (*10*). Using the method of equal-appearing intervals, Morrison constructed a severity scale of articulation defectiveness. Observers were asked

to place samples of children's speech along a *one* to *nine* severity continuum, *one* denoting least severe and *nine* denoting most severe articulation defectiveness. In a subsequent study, Sherman and Morrison (*13*) used the original Morrison samples of speech to determine the reliability of individual ratings of defective articulation. They concluded that speech samples can be reliably placed in relative positions along a severity continuum, even though absolute ratings of the severity of defectiveness are not necessarily comparable from one individual observer to another. They also concluded that results would be equally reliable when either five- or 10-second speech segments were used.

Another investigation conducted at Ohio State University to determine the reliability of the Morrison Scale (*9*) concluded that a reliability of .90 would be obtained if either 10 judges and two speech items for each subject or six judges and four items for each subject were used.

The most common method of measuring articulation is counting the errors made on an articulation test. Several studies have found a positive relationship between articulation errors and intelligibility (*4, 6, 11*). Counting sound errors gives a rough numerical indication of defectiveness. This method is insufficient for research purposes. In cases of multiple articulatory defects, comparing the speech of different children is difficult. Furthermore, since some sounds appear very seldom in the English language, inability to produce such sounds cannot be considered as severe a problem as inability to produce more frequently used sounds.

One attempt to assign a numerical score to defective articulation was made by Wood (*17*) in his study of parental maladjustment and functional articulatory disorders. Wood asserted that consonant sounds played the most important role in speech intelligibility and constructed an Articulation Index based on Travis's table of the frequency of occurrence of consonant sounds in the speech of American children (*14*). He prorated the values of Travis's table into the initial, medial and final positions in words. The numerical values of the sounds correctly produced on an articulation test were added together to obtain a quantitative description of the child's ability to articulate sounds correctly.

Henrikson (7) criticized Wood's equal prorating, showing that consonant sounds did not appear equally in all positions. His findings concerning the frequency of occurrence of consonants did, however, approximate those of Travis. Mader (*8*) further investigated the distribution of consonant sounds and upheld Henrikson's findings.

In defense of his method, Wood (*16*) pointed out that the positions of consonant sounds were not stable in continuous speech. The position of a sound was relative, not only to its position in a word, but to the placing of the word in a sentence and the phrasing of the sentence. He also stated that considering consonant sounds in positions rather than as a single value allowed partial credit for partial learning in speech therapy.

Using judges to rate samples of speech is impractical as a clinical and research tool. It is too cumbersome a method and the resulting rating is relative to the sample presented. In a numerical score the subjective evaluation is reduced to a minimum. Whether a child misarticulates or omits a sound is an easier decision than where he fits along a severity continuum. If a numerical score is based on the frequency of occurrence

of speech sounds, it can also be said to relate to speech adequacy. A numerical score is the only method of measuring articulation which can be statistically manipulated.

Wood's Articulation Index included only consonants. If a score is to represent accurately speech adequacy, it must include all speech sounds. Therefore, the frequency of occurrence studies were reviewed in an effort to find a complete sound distribution table.

Frequency of Occurrence Studies. Dewey (*3*) counted the frequency of occurrence of consonants, vowels and diphthongs in English and American written material. Travis' (*14*) study of consonant sounds in speech included children, adult laborers, and university adults. Voelker (*15*) studied radio speech to determine the frequency of occurrence of vowels and consonants in formal American speech. Mader (*8*) compared the frequency of occurrence of consonant sounds in the speech of children in the primary grades. All of the tables resulting from these studies showed similar sound distributions.

The most complete study of the relative frequency of occurrence of sounds in American speech was conducted at Bell Laboratories by French, Carter and Koenig (*5*). The material for the study was obtained from a series of telephone conversations over typical toll circuits which terminated in the city of New York. The words used in the conversation were noted in the following manner: Only the nouns were recorded one week; the next week the observer recorded all verbs; only adjectives and adverbs were recorded during the third week. This procedure was repeated until observations had been made for 500 conversations for each of the three groups of words. Pronouns, articles, prepositions and conjunctions were noted in additional conversations. However, it was decided that 150 conversations in each case were sufficient. Certain classes of words—proper names, titles, interjections, letters, numbers, and vocalized pauses such as *er* or *ub*—were omitted entirely from the frequency count.

Words recorded by this sampling technique were not exactly the same as the words which would have been obtained had the entire conversation been recorded in each case. However, a different observer later recorded all verbs in 250 conversations as a check against the already recorded verbs. The word lists compiled by the two different observers corresponded closely. A table was compiled containing 737 words which were heard in at least one per cent of the conversations; this list formed 96 per cent of the total occurrences of all words. It was also found that 2240 different words were used in the conversations, which consisted of 80,000 words. The omission of the 1500 least common words changed the sound distribution by negligible amounts.

The syllable was used as the basis for the sound frequency analysis. Words were divided into phonetic syllables, not orthographic syllables. The dictionary was not used as the authority for either syllabification or pronunciation. Such words as *every*, *preference* and *average* were divided into two syllables according to colloquial pronunciation. A single pronunciation was assigned to each of the recorded words according to the most typical pronunciation in reasonably enunciated speech among the educated people of New York. For instance, the vowel sound in *pot* and *palm* was considered the same, even though there is a real distinction in New England pronunciation.

TABLE 1. Sound values for the Articulation Score: equal prorating by word position (AS).

Consonants						*Vowels*		
Sound		*Value*				*Sound*		*Value*
		Initial	*Medial*	*Final*	*Total*			
[t]		3.00	3.00	3.00	9.00	[ə]	*a*bout	6.80
[n]		1.71	1.71	1.71	5.13	[ɪ]	pin	5.86
[r]		1.55	1.55	1.55	4.65	[ɛ]	pen	3.21
[d]		1.41	1.41	1.41	4.23	[aɪ]	pine	3.16
[l]		1.24	1.24	1.24	3.72	[æ]	pan	2.87
[s]		1.11	1.11	1.11	3.33	[ɑ]	pot	2.72
[m]		1.10	1.10	1.10	3.30	[i]	peel	2.69
[k]		1.01	1.01	1.01	3.03	[u]	pool	2.61
[w]		1.35	1.35		2.70	[eɪ] [e]	pane	1.99
[ð]	*th*en	0.77	0.77	0.77	2.31	[oʊ] [o]	pole	1.98
[f]		0.70	0.70	0.70	2.10	[ɚ]	differ	1.90
[z]		0.68	0.68	0.68	2.04	[ɔ]	pawn	1.73
[j]	*y*	0.93	0.93		1.86	[ʌ]	pun	1.73
[h]		0.83	0.83		1.66	[ʊ]	pull	1.23
[v]		0.54	0.54	0.54	1.62	[aʊ]	pout	0.70
[b]		0.51	0.51	0.51	1.53	[ɝ]	purr	0.33
[p]		0.50	0.50	0.50	1.50	[ju]	pew	0.11
[g]	*g*un	0.49	0.49	0.49	1.47	[ɔɪ]	poise	0.08
[ŋ]	*ng*		0.53	0.53	1.06			41.70
[ʃ]	*sh*	0.20	0.20	0.20	0.60			
[θ]	*th*in	0.20	0.20	0.20	0.60			
[tʃ]	*ch*	0.10	0.10	0.10	0.30			
[dʒ]	*j*	0.09	0.09	0.09	0.27			
[hw]	*wh*en	0.13	0.13		0.26			
[ʒ]	*zh*	0.01	0.01	0.01	0.03			
		20.16	20.69	17.45	58.30			
								100.00

Problem

The basic assumption underlying this investigation is that if an Articulation Score based on the relative frequency of occurrence of all speech sounds correlates highly with competent subjective evaluations of an individual's articulatory proficiency, then the Articulation Score is a valid measure of articulatory proficiency.

Procedure

Articulation Score. Since the Bell Laboratories study (*5*) was the most complete and since it appeared to be the most accurate, the frequency of occurrence tables resulting from this study were used as the basis for the Articulation Score in the present investigation.

Wood's reasons for equal prorating of consonants (*16*) were thought to be valid. To give partial credit for partial learning of a sound, it is necessary to have some division of consonant sounds. Most speech therapists use the three word positions—initial, medial and final—in articulation tests and therapy. For these reasons the

total consonant values of the Bell frequency analysis were prorated into three word positions. Sounds which do not normally appear in three positions were prorated equally according to the number of positions in which they can be found in American speech. Thus, [t] was prorated into initial, medial and final; while [h] was prorated into two positions, initial and medial.

For purposes of scoring in the present study, a few of the original Bell Laboratories figures were combined into like classes. The [ɑ] in *par* was added to [ɑ] in *pot;* [ɛ] in *pair* was added to [ɛ] in *pen.* In the same manner [ɪ] in *receive* was added to [ɪ] in *pin.* The unstressed vowel sounds in *possible, about, notion, wanted* and *people* were combined into the single category [ə].

In the category of the blends a small proportion (1.39 per cent) was assigned to 'others.' The representativeness of the word list published in the Bell Laboratories report has been mentioned previously. Because this list of words represented 96 per cent of all words recorded, it was assumed that the distribution of the 1.39 per cent of unassigned blends would be sufficiently accurate if the blends not previously noted but appearing in the word list were to be counted and proportionately divided into 1.39 per cent. The percentage of times each blend occurred in the list was added to the original figures for the consonants concerned. All blends were combined with the consonants in the present study. The initial consonants in initial blends were added to the initial consonant total; the final consonants in the final blends were added to the total for the final consonants. Thus, the percentage for [st] in the initial position was added to [s]. In the final position it was added to [t].

By dividing the number of sounds in each category—vowels, initial consonants, and final consonants—into the total number of sounds recorded in the Bell Laboratories study, the conversion factors of 0.417 for vowels, 0.288 for initial consonants, and 0.295 for final consonants were determined. Multiplication of each sound by its respective conversion factor gave the frequency of occurrence of each sound relative to every other sound. The total of the converted figures equals 100 per cent.

Table 1 shows the values for each sound according to its relative frequency of occurrence in American speech. When the values of all misarticulated sounds are subtracted from 100 per cent, the Articulation Score results. The Articulation Score, therefore, represents the adequacy, in arithmetical form, of the subject's articulation. For example, if a child substituted [w] for [r] in the words *ruler, celery* and *car,* and [w] for [l] in *lamb, umbrella* and *doll,* and omitted [s] in *Santa Claus* and *pencils,* he would have missed [r] and [l] in all positions and [s] in initial and medial positions. His Articulation Score (AS) would be computed in the following manner:

Sound	*Initial*	*Medial*	*Final*	*Total*
[r]	1.55	1.55	1.55	4.65
[l]	1.24	1.24	1.24	3.72
[s]	1.11	1.11		2.22
Total				10.59

Since $100 - 10.59 = 89.41$, AS = 89.41.

It can be said that approximately 90 per cent of the child's speech can be understood.

The Bell Laboratories sound frequency analysis considered the consonants as initial or final in the syllable. No medial sounds were recognized. The possibility that an Articulation

TABLE 2. Sound values for the Articulation Score: consonant values determined by syllable position (AS′)

Consonants					Vowels		
Sound		*Value*			*Sound*		*Value*
		Initial	*Final*	*Total*			
[t]		2.52	6.49	9.01	[ə]	*a*bout	6.80
[n]		1.44	3.69	5.13	[ɪ]	pin	5.86
[r]		0.80	3.85	4.65	[ɛ]	pen	3.21
[d]		1.81	2.40	4.21	[aɪ]	pine	3.16
[l]		1.24	2.48	3.72	[æ]	pan	2.87
[s]		1.93	1.39	3.32	[ɑ]	pot	2.72
[m]		1.70	1.62	3.32	[i]	peel	2.69
[k]		1.76	1.27	3.03	[u]	pool	2.61
[w]		2.70		2.70	[eɪ] [e]	pane	1.99
[ð]	*th*en	1.94	0.37	2.31	[oʊ] [o]	pole	1.98
[f]		1.32	0.79	2.11	]ɚ[	differ	1.90
[z]		0.10	1.94	2.04	[ɔ]	pawn	1.73
[j]	*y*	1.87		1.87	[ʌ]	pun	1.73
[h]		1.66		1.66	[ʊ]	pull	1.23
[v]		0.36	1.25	1.61	[aʊ]	pout	0.70
[b]		1.40	0.12	1.52	[ɝ]	purr	0.33
[p]		1.14	0.37	1.51	[ju]	pew	0.11
[g]	*g*un	1.36	0.11	1.47	[ɔɪ]	poise	0.08
[ŋ]	*ng*		1.05	1.05			41.70
[ʃ]	*sh*	0.50	0.09	0.59			
[θ]	*th*in	0.58	0.01	0.59			
[tʃ]	*ch*	0.16	0.16	0.32			
[dʒ]	*j*	0.24	0.04	0.28			
[hw]	*wh*en	0.26		0.26			
[ʒ]	*zh*	0.01	0.01	0.02			
		28.80	29.50	58.30			
							100.00

Score based on the original figures rather than the prorated figures was considered. Therefore, a tabulation was made of each subject's articulation based on initial and final consonant sounds. The values for the vowels did not change. This new score was called AS′ (see Table 2).

In the previous example the subject misarticulated [r], [l], and initial and medial [s]. The test words for [r] were *ruler, celery* and *car.* A consideration by syllables showed initial [r] in *ruler* and *celery* and final [r] in *car.* Syllable consideration of the test words for [l] showed initial [l] in *lamb* and *umbrella* and final [l] in *doll.* The omitted [s] in *Santa Claus* and *pencils* was initial in the syllable. The AS′ would be computed in the following manner:

Sound	*Initial*	*Final*	*Total*
[r]	0.80	3.85	4.65
[l]	1.24	2.48	3.72
[s]	1.93		1.93
Total			10.30

100.00 − 10.30 = 89.70 AS′ = 89.70

Subjects. Forty-five children, all attending school in the Tucson area, between the ages of six and 12 were used for this investigation. Nine of the subjects were receiving speech therapy; the others had received none. All children were referred by teachers or speech therapists on the basis of the presence of articulatory defects. No misarticulated sounds were found in the speech of two of the subjects. None of their speech was unintelligible.

Test Procedure. A picture articulation test containing all sounds in American speech was given to each child, and all sound errors were noted. Each child was assigned an AS and AS′ according to the methods previously described. Following the articulation test, each subject spoke until one minute of continuous speech had been tape recorded. The children talked about their Christmas presents or their pets.

Ratings by Judges. According to the studies conducted at Ohio State University (*9, 10, 13*), trained judges can reliably place tape recorded samples of speech along a severity continuum. In order to obtain a reliability r of .90, 10 judges and two speech samples for each subject or six judges and four samples are necessary (*9*). Ten observers who were unfamiliar with the subjects participated in the study. All judges were advanced students in speech therapy and had clinical experience with articulatory defects. Ten-second samples of the speech of 45 children were compiled from the one-minute recorded segments of speech. These were used throughout the training and judging sessions.

Half of the speech samples were presented at the first training session so that the observers could determine in their minds the range of defective articulation present on the tape. A tape was then played which presented 10-second samples of the speech of all subjects in random order. Judges were instructed to listen carefully to each sample of speech and to rate the articulation on a *one* to *nine* severity scale. *One* was considered least severely defective and *nine* was considered most severely defective articulation. They were asked to consider only articulation, ignoring all influence of age or of general effectiveness. Each judge gave a rating to each of the 45 speech samples.

All scores for the same child were averaged so that each child received a single score. The tape was played again, the composite ratings being announced before each selection was heard. If any observer felt the rating was not correct, that rating was discussed. For example, one boy received a better rating than some of the judges felt he should have. They thought that his apparent age, indicated by his voice and his subject matter (his teddy bear), had influenced the ratings. The selections which were questioned were judged again, and new ratings determined.

The second training session was devoted to listening to a tape of 13 selections representing the various levels of articulation. The samples for this training tape were chosen in the following manner: The selections were first chosen upon which there had been close agreement by the judges during the first training session. These ratings were then compared with the AS and AS′, which had been divided into nine equal levels. Those which appeared to be comparable were selected for the short training tape. The samples on the short training tape were arranged in descending order, *one* first and *nine* last. The judges were instructed to listen to this

tape and to determine in their own minds the intervals which were shown.

The final judging session began with a presentation of the short training tape. A new tape, containing 10-second samples of the speech of all 45 subjects in random order, was then played. After these samples were rated by the judges, the short training tape was again played. Different samples of the speech of the same children, arranged in random order, were then heard and rated by the judges.

Results

The Articulation Scores were similar whether the three consonant positions were considered (AS) or whether the initial and final syllable positions were used (AS′). When a child made a sound error in one position, he usually made the same error in all positions. For this reason, the Articulation Scores were expected to be similar for each child.

A judges' rating of *one* meant least severely defective articulation. In order to obtain a positive correlation between judges' ratings and Articulation Scores, the total of the values for all sound errors was used, before that total was subtracted from 100 per cent. In the example used above, 10.59 (AS) and 10.30 (AS′) would be correlated with the judges' rating.

The coefficient of correlation as computed from the raw scores produced an r of .9400 between the judges' ratings and the AS. The r for ratings of judges and AS′ was .9413. These figures indicate that there are negligible differences between Articulation Scores when sounds are prorated equally in all positions in words or when consonant sounds are given values determined by their position in the syllable.

Conclusions

The results of this investigation allow several conclusions to be made:

1. A score can be devised which will numerically represent a person's articulatory proficiency.

2. The Articulation Score is a valid and reliable method of determining proficiency of articulation. The Bell Laboratories figures (*5*) used as the basis for the score have been shown to be reliable. The method of using trained judges to ascertain the severity of defectiveness of articulation of given speech samples has also been shown to be reliable (*9*). Since all definitions of defective articulation relate the speech to the judgment of a listener, the close correlation obtained between the judges' ratings and the Articulation Scores provides an indication that the AS and AS′ are valid measures of articulatory proficiency.

3. Medial sounds may not be necessary in articulation tests and therapy. According to the results of this study, considering the syllable positions of consonants produces the same results as considering the position of the consonant sound in a word. A medial sound which is misarticulated may be related to the initial or final position in the syllable rather than to its medial position in a word. This particular problem will have to be investigated further before a final conclusion can be drawn.

Discussion

The Articulation Score was constructed to fill a need in speech therapy. Although it was designed primarily for research purposes, it can be used in clinical situations. If a person can give an articulation test, he can use the Articulation Score. Reports to physicians, teachers, and other

therapists (psychotherapists, physical therapists) can be made in a short period of time. As long as it is known that the score represents articulatory proficiency and that 100 per cent is the highest possible score, the score should be meaningful.

Only children were used in Morrison's (*10*) study. Since her methods were used to validate the Articulation Score, it was necessary to use children in the present study. However, even though this experiment was performed on children, the Articulation Score can be used for adults with equally satisfactory results. If both children and adults had been used, the possibility might have arisen of assessing the severity of defectiveness according to the 'normal.' The Articulation Score was not designed to tell how 'normal' articulation is; its purpose is to designate the amount of speech which can probably be understood in ordinary conversation. For this reason, the age of the subject should not affect the validity of the score.

The comparison of the two methods of determining an Articulation Score—by prorating consonants equally in all word positions or by considering all consonants relative to their positions in syllables—was not an original purpose of this investigation. The results of this study indicate that either method produces similar scores. A larger sample must be used so that the differences will be more apparent before a definite conclusion can be made. The Articulation Score has been designed so that either table of values can be used. Each individual who uses the Articulation Score will have to decide for himself which method he prefers until it is determined whether either of the methods is more accurate.

The Articulation Score has many advantages over any other method of articulation measurement which has been developed. It is related to social adequacy of speech and is much easier to use than a subjective method of evaluation. It is easy to interpret and can be computed in a few minutes. The Articulation Score is a numerically accurate method of measurement which can be statistically manipulated. This means that measures of central tendency and tests for significant differences can be made from the Articulation Score.

The Articulation Score is especially valuable for research purposes. It is discouraging to attempt articulatory research when a time-consuming method of determining progress, such as the ratings by judges, must be used. So much time must be spent getting defectiveness ratings that the original problem may be slighted.

Summary

Most of the presently available methods of measuring articulation involve time-consuming subjective evaluations of defectiveness. The present investigation was undertaken to construct an Articulation Score to numerically represent a person's articulatory proficiency.

A numerical value was assigned to each sound in direct proportion to the number of times that sound would probably occur in a sample of 100 sounds. Two Articulation Scores were constructed. The AS equally prorated consonant values for all positions in which they are found in American speech. In the second, the AS′, consonant sounds were distributed according to their positions in syllables. The values for the vowels and diphthongs were the same in both scores. Forty-five children whose articulation ranged from normal to severely defective were given an articulation

test and assigned Articulation Scores. The Articulation Scores were correlated with ratings by trained judges of the speech of the same children, a method of proven reliability. The coefficient of correlation between the judges' ratings and the Articulation Scores was .94. Since all definitions of defective articulation relate the speech to the judgment of a listener, the close correlation obtained provides an indication that the AS and AS′ are valid measures of articulatory proficiency. Moreover, the Articulation Score is numerically accurate, statistically manipulative, easily interpreted, and convenient and simple to use.

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Hierarchy in Education

The elementary school is not a 'lower' school but a school for young children. The secondary school is a school for adolescents—neither higher nor lower than any other school. The university is a special kind of school for adults. There is no higher school than the nursery school and kindergarten. There is no higher schooling than that in the first grade, the sixth grade or any other grade. There is no hierarchy of height in modern education. (Harold Benjamin, Professor Emeritus, George Peabody Teachers College. Quoted in the *DesMoines Register*.)

Clinical Notes

Esther L. Herbert, *Editor*

Psychological Implications of Consonant Sounds

Many attempts have been made to explain why certain children fail to acquire skill in consonant articulation comparable to other children of similar age, sex and intelligence. Certain problems, such as significant reduction in hearing, provide readily acceptable explanations for the speech deficit and permit the speech clinician to offer the child's parents definite reasons for the articulation differences. However, for every child who presents a clear-cut clinical picture, we have a sizable group whose pictures are far from clear-cut and about whom only the wildest speculation is possible. They seem *not* to have hearing loss, poor auditory discrimination or memory, faulty motor abilities, malocclusions, poor speech models at home, or tied tongues. In short, they seem to have nothing unusual; so we solve our diagnostic problems by calling them children with 'functional articulatory disorders.' This means only that we cannot find anything wrong with them except poor speech and that we are stumped.

Because we have a clinical responsibility to these children, we describe as accurately as possible what they do and do not do when they talk. We are rarely able to understand why the consonant sounds are defective in a given way rather than in some other way. In other words, we are rarely able to understand the dynamics involved in the choice of the speech symptom. In view of this, it would appear reasonable to give attention to possible psychic values which certain consonant sounds may have in the lives of particular children. In order to illustrate this point, we cite the case of six-year-old Bobby.

Bobby was first known to our pediatric center when his mother complained that he had intense anxieties such as fear of germs and concern about death. These anxieties were so severe that Bobby would become seriously upset and could not be reassured or comforted no matter what the parents did or said to him. There were frequent psychosomatic illnesses of moderate severity but sufficiently incapacitating to keep him away from school and to demand a great deal of attention from the parents. Since the parents, both well into middle age, were so very concerned about their only child and appeared to be unable to cope with the situation even with guidance from a psychiatrist, Bobby was hospitalized. His severe anxiety state was gradually reduced, and he was able to talk with a children's psychiatrist about his feelings. As he talked, the psychiatrist was made increasingly aware of a speech problem that seemed somewhat unusual, that tended to interfere with his adjust-

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ment in school, and that was still another source of concern to his parents. She referred him to the speech clinic in the belief that improved speech would make the child generally stronger and better able to meet the problems of living.

The first contact with Bobby did, indeed, reveal unusual speech. Language was superior for his chronological age. All consonant sounds with the exception of [s] and [h[were completely intact, and speech was intelligible. However, he omitted without exception all [s] and [h] sounds. They ''imply' did not appear in any form in ''is 'peech.' It was important to note that he was reluctant to attempt these sounds during stimulatability testing. When he was persuaded to attempt them and did so successfully, he immediately rejected speech emphasis and grew somewhat hyperactive. This reaction seemed to be related to a general increase in his anxiety level. In spite of these apparent responses to direct speech attention, the psychiatrist and speech pathologist agreed that speech therapy, presented somewhat indirectly, should be attempted. Therapy was begun during the weeks that Bobby was in the hospital and was continued on an outpatient basis after he was discharged.

Bobby's progress in therapy continued to support the contention that the particular consonants which he could but did not use in his speech were painful to him. One session in particular demonstrated this theory and marked the turning point in his speech therapy as well. He came to the clinic and, as usual, attempted a few words containing the problem sounds. Also, as usual, there was no question about his competency to produce the sounds quite acceptably. Shortly after the session began, a strong wind was heard around the corner of the building. Bobby responded with obvious anxiety to the whistling sound. In an effort to modify his fears, the clinician explained the source of the noise and, as an after-thought, showed him how he could make a similar whistle by blowing along the edge of a sheet of paper. In apparent glee Bobby made the sound over and over. He then walked over to a doll house in the therapy room and began to blow over the furniture piece by piece. During this cycle of play, he became quite expansive, the strong, fearless, adult Bobby. He continued with the activity until it was time to put the toys away at the end of the session. Obviously not wanting to leave, he prolonged his stay by carrying the doll furniture, piece by piece, to the toy cupboard. When the clinician said, 'Bobby is very strong to carry a stove all by himself,' he not only continued to put the furniture away one article at a time but asked the clinician to 'tell me I'm trong.'

After this session in the speech clinic, Bobby appeared no longer to fear his problem consonants. Whatever feelings of hostility or aggression he seemed to associate with these sounds had apparently been dissipated, and he began to incorporate them into his conversational speech. We do not claim that Bobby's emotional difficulties were solved in the speech clinic. We do believe, however, that his speech deficit existed on an emotional basis, that the sounds themselves were unacceptable to him, and that speech therapy directed toward improvement in the consonants *per se* would have failed miserably.

Conclusion. It becomes increasingly apparent that certain children may have psychologically d e t e r m i n e d speech symptoms and that these may well be the children who, after years

of speech therapy, retain their symptoms in unaltered form. It could well be that some children are driven farther away from acceptable speech patterns when we refer to an [s] sound as the snake sound. If the child already looks upon this sound as one of aggression, which is totally unacceptable to him, the clinician may be reinforcing his fears and making the sound more difficult for him to incorporate into his own speech. This leads us to the conclusion that, in cooperation with qualified research-oriented psychiatrists, we must delve systematically into the possible emotional dynamics of the various consonant sounds.

BETTY JANE MCWILLIAMS
University of Pittsburgh

Supervision of Student Clinicians by 'Radio'

Supervisors who observe student clinicians through one-way windows often would like to make a comment to the student during interview or therapy sessions. A device which allows the supervisor to communicate with the student without drawing the attention of others in the room has been constructed at the University of Minnesota Speech and Hearing Center, Duluth.

The device makes use of an obsolete hearing aid chassis with receiver, an eight-watt amplifier, number 16 wire, shielded microphone cable and a dynamic microphone such as the Electro-Voice model 600D. A transistor circuit as illustrated in Figure 1 can be built into the hearing aid chassis without too much difficulty.

Using the number 16 wire, one end is connected to the ground terminal of the amplifier (speaker) output and the wire then looped around the ceiling of the room or rooms to be 'wired.' An eight-ohm terminal is satisfactory. (In our newly constructed clinic, the aerial is placed above the false ceilings.) The receiver is held in the ear by a standard hearing aid ear mold or a plastic tube loop which is held to the ear by a rubber insert.

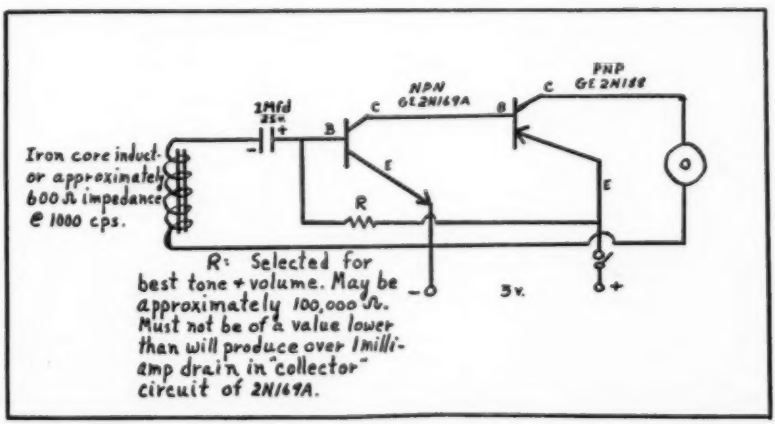
NPN GE 2N169A
PNP GE 2N188
1Mfd 25v
Iron core inductor approximately 600 Ω impedance @ 1000 cps.
R: Selected for best tone + volume. May be approximately 100,000 Ω. Must not be of a value lower than will produce over 1 milliamp drain in "collector" circuit of 2N169A.
3v.

FIGURE 1. Transistor circuit that can be built and inserted into hearing aid chassis.

A supervisor can observe a student in an interview or, as in the Duluth clinic, can sit in the middle of a three-room suite and observe two separate therapy sessions. Occasionally the student may need to make a slight position adjustment for clearer reception, and the observer noting this situation can repeat his comment. Comments can be directed to either student by name.

This 'on the spot' guidance and support seems to be a very effective clinical teaching device. In the four years of use, no parent or child has given any indication of interference from the technique.

ROBERT F. PIERCE

University of Minnesota, Duluth

A Student Advises His Teachers

Last year, when I was working as a Speech and Hearing Therapist in a Junior High School, I was asked to give a talk to a group of English teachers on 'How to Help the Stutterer in the Classroom.' I asked several of the students who stuttered what they thought I should say, and one ninth grader drew up a list of suggestions. I believe his list may help all who work with adolescent stutterers. It follows in the student's own words:

1. Treat the kid like everybody else.
2. Call on him as often as you'd call on anyone else.
3. If he stutters, hear him out to the end.
4. If he answers wrong, mark him like everybody else.
5. Look at him when he talks.
6. Don't feel sorry for him—don't pity him—he's got enough trouble.
7. Call on him at the beginning of the period—so he won't be tense all period.
8. Give him practice in speaking.
9. Be polite.

BARBARA BARD

Morton, Pa.

Coming in the May Journal

1. 'Speech Rehabilitation in Cerebral Palsy' by Morton Hoberman, M.D., and Shirley E. Hoberman.
2. 'Radiology in Speech Pathology' by Samuel G. Fletcher, Ralph L. Shelton, Jr., Carlisle C. Smith and James F. Bosma, M.D.
3. 'Language and Mentation in Two Phenylketonuric Children' by William M. Diedrich and Charles M. Poser, M.D.
4. 'Servo Theory and Stuttering' by Edward D. Mysak.
5. 'Historical Aspects of Hand Communication' by Henry M. Moser, *et al.*
6. 'Paternal Occupational Class and Articulatory Defects in Children' by Carl H. Weaver, Catherine Furbee, and Rodney W. Everhart.
7. 'Articulation Skills of Adolescent and Adult Cleft Palate Persons' by Donald Counihan.
8. 'Hearing Aid Evaluation: Reliability of Repeated Measurements' by Irvin Shore, Robert C. Bilger and Ira J. Hirsh.

Other valuable articles, stimulating book reviews, abstracts and clinical forum.

Abstracts

Phillip A. Yantis, *Editor*

Anatomy and Physiology

BÉKÉSY, G. v., Neural funneling along the skin and between the inner and outer hair cells of the cochlea. *J. acoust. Soc. Amer.*, 31, 1959, 1236-1249.

'An attempt has been made to show that (1) the rotating tones in hearing, (2) the rotating vibrations on the skin, (3) the difference limen for the smallest perceptible distance on the skin, and (4) Mach's law of contrast are all a consequence of the same funneling action of the nervous system.' . . . *(B.A.L.)*

GREMY, F., and SABOURAUD, O., Sobre la posibilidad de movimientos cuerdas vocales sin emisión sonora. (Concerning the possibility of movement of the vocal cords without emission of sound.) *Fono audiológica*, 4, 1958, 22-24.

Phonographic and glottographic recordings were made of two patients, one with 'pithiatic' dysarthria, and the other with 'cerebral' dysarthria. The recordings show that there can be vibration of the vocal cords without the passage of air which accompanies phonation. The vibrations without phonation are similar to those noted during phonation. These findings support the neurochronaxic rather than the aerodynamic concept of movement of the vocal cords during phonation. *(R. G.)*

KATSUKI, Y., WATANABE, T., and MARUYAMA, N., Activity of auditory neurons in upper levels of brain of cat. *J. Neurophysiol.*, 22, 1959, 343-359.

This paper was concerned with the auditory responses obtained from the medial geniculate body and the cerebral cortex. More than 100 adult cats were used. A thin wire electrode, under ether narcosis, was fixed for recording microphonic potentials from the round window of the tested ear. The most important finding was that the response area of a single neuron to sound stimulation is narrowest at the medial geniculate body among those determined for various regions from the periphery up to the cortex. At the cortex wider areas were obtained. Response patterns of neurons in the two regions, medial geniculate and cortex, were also different. It was concluded that the analysis of sound may be completed at the medial geniculate body, and that the neurons are concerned with discrimination of pitch and intensity of sound. The function of the cortical neurons may consist of the integration of those component sounds which have been completely analyzed during the passage of impulses through the neural network of the lower regions of the brain. *(M. N.)*

General

ELSER, R. P., The social position of hearing handicapped children in the regular grades. *Except. Child.*, 25, 1959, 305-309.

Forty-five hearing handicapped children (35 db or more from 500-2000 cps) ranging from 9-12 years were studied in terms of their acceptance in the classroom. They were not as well accepted by their classmates as the normal control group and generally did not receive a level of esteemed status

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by their peers. One variable relating to self-perception of their status yielded no significant finding. *(E. H. N.)*

Douglass, R., Basic feelings and speech defects. *Except. Child.*, 25, 1959, 319-332.

A psychological discussion of the social and emotional forces is presented with references to the infant's oral behavior as a predecessor to communication. 'There is a growing tendency in our studying of the origin of many speech problems to point the finger of suspicion at the parents of the child, particularly the mother.' The teacher is discussed from the viewpoint of her cultural influences on the older child. *(E. H. N.)*

Krugel, K., Eines neues Gerät zur Blitzphotographie des Larynx und Hypopharynx. (A new machine for making pictures of the larynx and hypopharynx.) *H N O, Berlin*, 7, 1959, 334-335.

The description of the machine must be read in the original. The duration of the single light beam is 1/50 to 1/60 of a second. *(E. F.)*

McWilliams, B. J., The speech pathologist looks at the nonverbal child. *Except. Child.*, 25, 1959, 420-423.

The author, a speech pathologist, warns against meaningless use of the term 'delayed speech.' It is only a 'descriptive term used sometimes to refer to children who are not talking at all and sometimes to refer to children who are talking. . . .'

The author describes procedures for diagnosis and discusses the need for psychometric and audiologic tests, as well as neurological, psychiatric and other medical examinations. *(E. H. N.)*

Rapin, I., The neurologist looks at the nonverbal child. *Except. Child.*, 25, 1959, 48-52.

The author contends that for differential diagnosis 'the neurologist by himself is usually incapable of solving the differential problem posed by a child who is retarded in his language development . . . a team approach involving an audiologist, a speech pathologist, a psychologist and a child psychiatrist, in addition to a neurologist—is the most efficient way to arrive at a correct diagnosis.' The neurologist decides on the presence or absence of brain damage. Details for differential diagnosis of aphasia are described. *(E. H. N.)*

Pathology

Bauer, H., Aphonie durch Kehlkopfasymmetrie infolge Wirbelsäulendeformierung bie einer Zwergin. (Aphonia due to asymmetry of the larynx caused by deformity of the vertebra column in a female dwarf.) *H N O, Berlin*, 7, 1959, 342-343.

Asymmetry of the larynx shows, as a rule, an unequal length of the vocal cords, an oblique position of the glottis, one of the arytenoid cartilages crossing the middle line more than the other, and one vocal cord, especially during phonation of high tones, situated higher than the other. Yet there have been a few cases described with good voices lasting for years, even though there was a difference in the level of the cords. Most of the time the asymmetry is congenital or familial, but it can also develop during the pubertal voice change due to misuse of the voice. The prognosis, according to the writer, is bad. A description is offered of a dwarf who was hoarse and at times even aphonic. *(E. F.)*

Botez, M. I., and Wertheim, H., Expressive aphasia and amusia. *Brain*, 82, 1959, 186-202.

A case history is presented of a right-handed man who had an expressive aphasia and marked amusia following a right frontal lesion. An original battery of tests was used to assess the musical functions of the patient. Loss of ability to produce tonal elements accurately and imperfect rhythmic pattern were noted. A discussion of these phenomena is presented. *(B. S. S.)*

Diehl, C. F., White, R., and Burk, K. W., Voice quality and anxiety. *J. Speech Hearing Res.*, 2, 1959, 282-285.

Persons with hoarse-breathy voices were more anxious than persons with normal voices or persons with harsh voices. *(B. A. L.)*

Johnson, W., Young, M. A., Sahs, A. L., and Bedell, G. N., Effects of hyperventilation and tetany on the speech fluency of stutterers and nonstutterers. *J. Speech Hearing Res.*, 2, 1959, 203-215.

'Data were obtained to test the hypothesis that stuttering is associated with latent

tetany . . . It was concluded that the stutterers and nonstutterers did not differ significantly with respect to alveolar air carbon dioxide tension, and that there were no significant changes in the speech fluency of the stutterers as a result of hyperventilation and tetany. There was however a slight decrease in the speech fluency of the nonstutterers following induction of tetany through hyperventilation. The findings imply that the problem called stuttering is to be differentiated from the problem of speech nonfluency, as such.' *(B. A. L.)*

LEMOYNE, J., and MAHOUDEAU, D., A propos d'un cas d'agnosie auditive pure avec surdité corticale associée à une dysphonie fonctionnelle. (A case of pure auditory agnosia with cortical deafness associated with a functional dysphonia.) *Ann. Otolaryng.*, 76, 1959, 293-310.

The authors report a clinico-anatomical study of a patient with two cerebro-vascular accidents followed by a third and fatal one. After the second, he was left with pure auditory agnosia; inner speech was intact as evidenced by his ability to read, and he was but slightly deaf. He could not comprehend speech or music. The voice was weak, infantile and whimpering, and the pitch was monotonous. Stroboscopic examination showed constant variability in approximation of the vocal and ventricular folds, with hypertonicity of the laryngeal mechanism. Deafness was cortical and subcortical; the auditory function, however, was intact at the bulbar level.

Postmortem macroscopic and histologic examination indicates bilateral lesions of temporal lobes interfered with the auditory radiations. The authors stress the importance of the Heschl gyri for the projection of the primary auditory message in the brain's decoding of meaningful sounds. *(R. W. A.)*

LUCHSINGER, R., Die Vererbung von Sprach- und Stimmstörungen. (The inheritance of speech and voice disorders.) *Folia Phoniat., Basel*, 11, 1959, 7-64.

'In a survey of the inheritance of voice and language, and their disorders, the author deals with such hereditary components as fine motor control, intelligence and mode of language development, as affecting both voice-type and pathological reactions. Case histories of families and twins enable a type to be distinguished showing a hereditary language weakness. This embraces inherited cases not only of retarded language development, general dyslalia and agrammatism, but also of cluttering and clutter-stammering. In speech and voice therapy, as in other fields, it is not easy to separate heredity clearly from environmental factors. However, modern methods enable us to differentiate stammering better, and in many cases an hereditary disposition can be regarded as established. In one group of patients, however, tonic speech disturbances are produced by the combination of an abnormal psychic disposition with a pathological speech-mechanism resulting from exogenous brain-damage. Little has been known hitherto about the hereditable diseases of the larynx which produce voice disorders. They include principally the pathological hypoplastic (to some extent allergic) reactions, affecting the entire mucous tract, which result in polypi and hyperplasias of the vocal cords. According to present-day knowledge, singers' nodes are conditioned by exogenous factors such as vocal strain and inflammation.' *(Author's summary)*

MORROW, J. T., A psychiatrist looks at the nonverbal child. *Except. Child.*, 25, 1959, 347-367.

The author, a psychiatrist, emphasizes differential diagnosis and discusses several possible etiologies of nonverbalism such as congenital aphasia, deafness and psychoses. In reference to the latter, the symbiotic psychoses of Mohler where the child fails to separate himself from the mother is contrasted with Kanner's infantile autism where the child fails to make primary identification with the mother. To say the child's speech is psychogenic is not sufficient. All children 'short of pure idiocy' feel and recognize their deficit. 'We must ask how his psychologic mechanism receives or senses this organic deficit.' The author also contends that psychological functioning is not synonymous with neuro-physiological functioning and we must attempt to understand the relationship of the two. *(E. H. N.)*

PECHTEL, C., and MASSERMAN, J. H., Cerebral localization: not where but in whom. *Amer. J. Psychiat.*, 116, 1959, 51-54.

Individual and group reactions, learning techniques and capacities, and neurotic and drug-influenced behavior patterns of 64 cats and 49 monkeys were studied from 34

to 75 months before and after the implantation of lesions in 10 neo-paleo and subcortical brain areas. The following observations were made: (1) there are effects specific to each lesion in spite of individual variations; (2) there are general changes common to lesions in several different areas; (3) the effects of any lesion are highly relatable to preoperative characteristics and behavior; and (4) the effects are further dependent on the nature of post-operative experience. *(B. S. S.)*

Ward, W. D., Glorig, A., and Sklar, D. L., Susceptibility and sex. *J. acoust. Soc. Amer.*, 31, 1959, 1138.

On the basis of the present investigation it does not appear that there are sex-linked differences among young people in terms of susceptibility to a temporary threshold shift from noise exposure. Rate of recovery does not differ. *(B. A. L.)*

Psycho-Acoustics

Bilger, R. C., Additivity of different types of masking. *J. acoust. Soc. Amer.*, 31, 1959, 1107-1109.

'Two experiments were carried out to determine how masking for frequencies either above or below one band of noise combines with the critical-band type masking produced by a second band of noise. The results of both experiments indicate that at moderately high levels the combination of critical-band masking with another type of masking results in a six db increase in masking. The implications of this result are discussed.' *(Author's precis)*

Ehmer, R. H., Masking patterns of tones. *J. acoust. Soc. Amer.*, 31, 1959, 1115-1120.

'Monaural masking patterns were obtained for pure tones spaced by octaves from 250 cps to 8000 cps at 20-100 db SL on three listeners in an attempt to provide extensive data assessing the relative importance of aural harmonics and cochlear spread of masking tone activity in the extension of masking to frequencies above the masking tone. The masking patterns confirm and extend the results of others, but especially indicate that second peaks do not necessarily occur at the second harmonic of the masking tone.' . . . *(B. A. L.)*

Ehmer, R. H., Masking by tones *vs* noise bands. *J. acoust. Soc. Amer.*, 31, 1959, 1253-1256.

Results of the study indicate that 1/3 octave noise bands produce about the same amount of extended masking as do pure tones of frequencies around which the noise bands are centered. *(B. A. L.)*

Harris, C. M., Residual masking at low frequencies. *J. acoust. Soc. Amer.*, 31, 1959, 1110-1115.

Auditory fatigue of short duration, as from a masking source following the cessation of masking, is called 'residual masking.' From patterns of residual masking data, plots of loudness density *vs* frequency were computed. *(B. A. L.)*

Nixon, C. W., and von Gierke, H. E., Experiments on the bone-conduction threshold in a free sound field. *J. acoust. Soc. Amer.*, 31, 1959, 1121-1125.

In the present experiments, the head, or portions thereof, of the subjects was covered with cotton to attenuate sounds reaching the ear via bone. Ears were covered with muffs. Results indicate that free-field bone-conduction is raised by cotton padding around the head. Implications for noise-attenuating devices are discussed. *(B. A. L.)*

Pickett, J. M., Low-frequency noise and methods for calculating speech intelligibility. *J. acoust. Soc. Amer.*, 31, 1959, 1259-1263.

'Speech intelligibility was tested in a low-frequency masking noise. Various conditions of speech and noise filtering below 1200 cps were employed in order to test the relative effects of direct low-frequency masking and upward spread of masking to higher frequency regions . . . It is concluded that the low frequency energy in the noise produced upward spread of masking. This interpretation is reinforced by the fact that spread of masking was greater at higher noise levels and also at lower speech-to-noise ratios. Implications for calculating the effects of noise interference upon intelligibility are discussed.' *(B. A. L.)*

Pollack, I., and Trittipoe, W. J., Binaural listening and interaural noise cross correlation. *J. acoust. Soc. Amer.*, 31, 1959, 1250-1252.

'The identification of different interaural correlations was examined over a range of reference correlations. Interaural correlations were produced by the method of Licklider and Dzendolet in which three independent noise sources were combined into two outputs. The change in interaural correlation (squared) required for 75 per cent correct identification varied from almost 0.4 for a reference correlation of 0.0 to about 0.04 for a reference correlation of 1.0.' *(Authors' precis)*

SCHUBERT, E. D., and ELPERN, B. S., Psychophysical estimate of the velocity of the traveling wave. *J. acoust. Soc. Amer.*, 31, 1959, 990-994.

In a modification of the original Békésy method of studying traveling waves, a different length of the basilar membrane of two ears was masked so that a click was lateralized subjectively to the ear with the shorter portion masked. Measurements were thus taken of the amount of external delay to return the subjective click to the center of the head. Velocity estimates were from 55 m/sec to 30 m/sec, depending on location along the basilar membrane. *(B. A. L.)*

STEVENS, S. S., On the validity of the loudness scale. *J. acoust. Soc. Amer.*, 31, 1959, 995-1003.

In a detailed discussion of loudness scales, the author defends his *sone* scale by answering the more important of the criticisms leveled against it. The author concedes that his loudness scale should be tested by various means so as to establish more firmly its validity and reliability. *(B. A. L.)*

THURLOW, W., and TABORY, L., Effects of repeated presentations of a tone upon absolute loudness judgments. *J. gen. Psychol.*, 60, 1959, 161-166.

Seventy subjects participated in judging the loudness of a 1000 cycle tone that was presented for one second every five seconds until 100 presentations had been made. Experimental groups consisted of 10 persons per group. Experimental conditions were varied from group to group in terms of the intensity at which the tone was presented. It was found that the judgments of loudness of the tones of lowest intensity tended to decrease whereas judgments of the loudness of the tones of highest intensity tended to increase. *(H. J. O.)*

THURLOW, W., and TABORY, L., Judgments of the loudness of a series of tones with two different range expectancies. *J. gen. Psychol.*, 60, 1959, 167-172.

The experimenters were investigating the function of end stimuli as 'anchors' by obtaining loudness judgments on a series of tones by presenting single stimuli and also by giving the subjects the possibility of receiving tones which might vary in intensity. When subjects expected that the tones would remain the same as demonstrated, the tones were assigned lower average ratings than when they expected that the tones might vary in intensity. The investigators concluded that end anchors are important in the determination of general accuracy of judgment. *(H. J. O.)*

WOODHEAD, M. M., Effect of brief loud noise on decision making. *J. acoust. Soc. Amer.*, 31, 1959, 1329-1331.

'An experiment was designed to investigate whether irrelevant loud bursts of low-frequency noise affected decision-making unfavorably. Analysis of the results revealed a significant decrement in performance due to the noise distraction.' . . . *(B. A. L.)*

WRIGHT, H. N., Auditory adaptation in noise. *J. acoust. Soc. Amer.*, 31, 1959, 1004-1012.

When a normal ear has noise introduced into it, adaptation is excessive at 4000 cps, but not at 250 or 1000 cps. That is, when noise is introduced in addition to a tone, adaptation is greatest at 4000 cps. *(B. A. L.)*

Rehabilitation

BOURDIAL, J., LALLEMANT, Y., and GARDETTE, M., Les résultats auditifs de la chirurgie auriculaire chez l'enfant. (Results of auricular surgery in children.) *Ann. Otolaryng.*, 76, 1959, 721-743.

Audiometric examinations of 86 children after atticotomies for chronic otitis indicate improved hearing in 27 per cent, conserving of it in 57 per cent, and worsening of it in 16 per cent. Losses are less severe and less variable than in adults, and the curve of hearing tends to be level pre- and post-operatively. It is not the age of the child but of the suppuration that indicates the need for operating. Hearing gains are

modest, ranging between five and 10 db, and they have lasted up to six years following atticotomy. *(R. W. A.)*

Byers, V. W., and Lieberman, L., Lipreading performance and the rate of the speaker. *J. Speech Hearing Res.*, 2, 1959, 271-276.

On the basis of filmed lipreading tests shown at various rates, no significant differences were found in number of words correctly read as a function of rate. *(B. A. L.)*

Jones, M. V., The boy who would not talk. *Except. Child.*, 25, 1959, 400-401.

The specific case of a Mexican-American boy is traced over a period of time. His problems and progress are presented as a longitudinal study. *(E. H. N.)*

Pedersen, E., and Schleisner, P., Effect of 'CIBA 13.155' in the treatment of spastic paraplegia. *Acta psychiat., Kbh.*, 34, 1959, 342-353.

'CIBA 13.155 is a new muscle relaxant exerting its action by depression of the polysynaptic pathways. The effect of the drug was studied in 50 patients, mainly with spastic paraparesis. It is effective on oral administration and, during an experimental period of seven months, did not give rise to serious side effects. It has an excellent effect on disturbances in bladder control, in particular on pollakiuria and incontinence. In about one half of the cases, appreciable relaxation of muscular tone was obtained, with subsequent improvement of the gait.' *(P. A. Y.)*

Schreiber, F., Your child learns to talk. *Today's Hlth*, 37, 1959, 48-49.

Parents are advised on how to prepare and train their children for good speech; they are considered the most important speech teachers. Language development is treated as a family adventure. Suggestions are very specific for helping the child at the various stages from birth to five years. *(E. H. N.)*

Sommers, R. K., Shilling, S. P., Paul, C. D., Copetas, F. G., Bowser, D. C., and McClintock, C. J., Training parents of children with functional misarticulation. *J. Speech Hearing Res.*, 2, 1959, 258-265.

Two matched groups of children with articulation errors were set up, the parents of one receiving intensive instruction for home help, the parents of the other receiving no special instructions. The children were tested periodically for articulation errors. Results show that the two groups of children showed about the same improvement in increasing the number of correct sounds. The experimental group showed reduction of substitutions and distortions, while the control group showed reduction of omissions. Parental attitude toward the children was not different between the groups. *(B. A. L.)*

Taylor, W., and Taylor, I., The education of physically handicapped children in Finland. *Except. Child.*, 25, 1959, 358-367.

In brief survey form the authors describe the incidence of several physical handicaps and resources available to them. Included were the deaf, hard of hearing, speech disorders, cerebral palsy, *etc.* Finland's incidence of hard of hearing in the elementary schools is 0.36 per cent, and the incidence of speech problems is three per cent for children between seven to 15 years inclusive. *(E. H. N.)*

Van Hattum, R. J., Evaluating elementary school speech therapy. *Except. Child.*, 25, 1959, 411-414.

This is a preliminary report of a program under present investigation at Rochester, N. Y. The objectives are to improve case selection and eliminate the case load of those children who would have improved through natural maturation. They are also studying preventive programs, new scheduling methods, and how to provide information for parents concerning where to secure additional assistance. *(E. H. N.)*

Weinstein, S., Experimental analysis of an attempt to improve speech in cases of expressive aphasia. *Neurology*, 9, 1959, 632-635.

This study was designed to confirm Birch's finding that intensive binaural stimulation in patients with expressive aphasia causes immediate improvement of their speech. Eighteen expressive aphasics were tested before and during intensive binaural stimulation with a tone of 250 cps at 60 db above their hearing threshold for 30

seconds. Neither the group nor any individual patient demonstrated improvement on any of the testing. The author could offer no explanation for the discrepancy. *(B. S. S.)*

Speech Science

AHMEND, R., and FATEHCHAND, R., Effect of sample duration on the articulation of sounds in normal and clipped speech. *J. acoust. Soc. Amer.*, 31, 1959, 1022-1029.

'Segments of vowels and consonants from nonsense syllables, accurately determined in position and width, are used for articulation measurements. The listening tests are performed on differentiated speech, and on differentiated speech subjected to severe clipping. Whether or not vowels are clipped, their segment lengths can be considerably reduced with little effect on articulation. This does not hold for consonants, with the exception of unclipped semivowels. The high articulation of interrupted speech is discussed, and some results are given.' *(Authors' precis)*

BRUBAKER, R. S., and ALTSHULER, M. W., Vowel overlap as a function of fundamental frequency and dialect. *J. acoust. Soc. Amer.*, 31, 1959, 1362-1365.

One group of students who spoke the General American dialect and one group who spoke a subdialect recorded two syllables which differed only in the medial vowel. Under one condition, fundamental frequency of the vowel was controlled; under the other condition, only the over-all SPL was controlled. Spectrographic analysis of the recordings indicated that controlling fundamental frequency does not reduce vowel overlap, but controlling the subdialect of the speaker does reduce overlapping. *(B. A. L.)*

DAVIDSON, G. D., Sidetone delay and reading rate, articulation, and pitch. *J. Speech Hearing Res.*, 2, 1959, 266-270.

'. . . Observed reading time increased with each increase in delay time; differences between the shorter-than-normal and each of the other delay times were significant. Extent and rate of inflection were significantly greatest for the shorter-than-normal delay time. There was no evidence that the other variables studied were affected by the changes in delay times.' *(B. A. L.)*

DENES, P., A preliminary investigation of certain aspects of intonation. *Lang. and Speech*, 2, 1959, 106-122.

'Intonation is the linguistic form in which the speaker organizes certain kinds of information. It is well-known that intonation is related to the fundamental frequency pattern of the speech wave, but it must also be related to changes along other acoustic dimensions because the intonation "tones" are still recognizable in whispered speech. The fundamental frequency, intensity, spectrum and duration changes associated with six intonation "tones" were investigated. . . . The relation of acoustic variables and intonation was further investigated by using speech synthesis. Syllables with the same spectrum and intensity were generated in which the fundamental frequencies were controlled by the intensity variations of humanly-produced syllables spoken on six different intonation "tones." The test established that the synthesized syllables conveyed some of the information about the intonation of the humanly-produced syllables. Methods for carrying out experiments on intonation with phonetically untrained subjects were investigated. . . . The importance for analysis-synthesis telephony of more extensive knowledge about intonation is discussed in some detail.' *(P. A. Y.)*

MCCROSKEY, R. L., CORLEY, N. W., and JACKSON, G., Some effects of disrupted tactile cues upon the production of consonants. *South. Speech J.*, 25, 1959, 55-60.

Consonant errors were studied under conditions which disrupted tactile feedback. Results indicate that substitutions were the most frequent type of error; final consonants were the most severely affected; and consonants of relatively short duration were most often produced erroneously. *(B. A. L.)*

SHEARME, J. N., and HOLMES, J. N., An experiment concerning the recognition of voices. *Lang. and Speech*, 2, 1959, 123-131.

'A subjective experiment is described which confirms that characteristics of the spectral envelope of speech, notably formant positions, contribute to our ability to

recognize a speaker's voice. Speakers with similar accent and rate of speaking were selected and their larynx frequency characteristics were eliminated in a vocoder system with fixed voicing frequency. A direct subjective comparison of resulting voice samples showed that the speakers' voices were still highly recognizable. A proportion of the voice samples were subjected to further treatment consisting of constant shifts of formants. It was found that the recognizability of the samples was destroyed although intelligibility was unimpaired.' *(Authors' precis)*

SNIDECOR, J. C., REHMAN, I., and WASHBURN, D. D., Speech pickup by contact microphone at head and neck positions. *J. Speech Hearing Res.*, 2, 1959, 277-281.

Speech is apparently most intelligible when picked up from contact microphones at any of the following positions: forehead, mastoid process, larynx, mandibular angle, ear canal and nose. *(B. A. L.)*

Testing and Measurement

BARTL, F., Critical evaluation of audiometric follow-up tests in industry. *Noise Control*, 5, 1959, 243-246, 260.

On the basis of large numbers of audiometric tests at one of the Boeing plants, a combination of screening and threshold tests has been found practically and legally acceptable. Single-frequency screening was not acceptable. Screening is performed at 15 db at 500, 1000, 2000 and 4000 cps in an audiometric testing booth which is equipped with wheels so that it may be brought to the workers on the job. *(B. A. L.)*

CHAIKLIN, J. B., The conditioned GSR auditory speech threshold. *J. Speech Hearing Res.*, 2, 1959, 229-236.

Experimental data indicate that speech reception testing by PGSR is feasible. *(B. A. L.)*

CHAIKLIN, J. B., The relation among three selected auditory speech thresholds. *J. Speech Hearing Res.*, 2, 1959, 237-243.

Data for normal-hearing subjects on speech detection threshold, speech reception threshold, and threshold of perceptibility for running speech were obtained and analyzed. *(B. A. L.)*

MARQUEZ-REVERON, V., ORAMAS, R., and MATHEUS, J. A., Localización de una lesión central por medio de la semiologia y la clinica otorrinolaringológicas. (Localization of a central lesion by means of symptomatology and clinical otorhinolaryngology.) *Fono audiológica*, 4, 1958, 34-38.

A 22-year-old man was examined seven months after he began stuttering. Observations included a case history, laryngoscopy, voice and speech tests, audiometry, caloric and rotatory vestibular tests, neurologic examination and electroencephalography. The combination of symptoms and signs pointed toward a lesion in the right anterolateral region of the cerebellum. *(R. G.)*

MONSEES, E. K., Aphasia and deafness in children. *Except. Child.*, 25, 1959, 395-399.

Childhood aphasia is defined as 'the inability to use and/or understand spoken language and is the result of damage or defect in the CNS.' The receptive and expressive syndromes are reviewed in respect to therapy and testing procedures. Early and accurate differential diagnosis is stressed along with the possibility of multiple handicaps in children. *(E. H. N.)*

RAINVILLE, M. J., New method of masking for the determination of bone-conduction curves. *Trans. Beltone Inst. Hearing Res.*, 11, 1959. A translation of 'Nouvelle Methode d'Assourdissement pour le Releve des Courbes de Conduction Osseuse,' *J. franc. O. R. L., Lyon*, 4, 1955, 851-858.

A new method of masking for bone conduction is introduced in which (1) the air-conduction threshold at a given frequency in the ear in question is determined; (2) the amount of masking noise necessary to mask the air-conducted tone is determined, this noise being introduced via the air route through the same earphone; (3) with the pulsed pure tone at threshold left in the earphone, the noise is introduced through a bone-conduction vibrator until it masks the air-conducted tone. The absolute bone-conduction threshold for the given tone then equals the 'threshold of air conduction, minus intensity of noise transmitted by air conduction to mask this threshold, plus intensity of noise emitted by bone conduction to mask this same threshold.' The rationale for this method is explained in detail. *(B. A. L.)*

Book Reviews

Ernest H. Henrikson, *Editor*

BARBARA, DOMINIC, *The Art of Listening*. Springfield: Charles C. Thomas Co., 1958. Pp. 201. $5.50.

'The more we tend toward health and self-realization, the better listeners we will become . . . And the more relaxed, spontaneous, alive, and productive we become, the more effectively will we be able to listen and the better able will we be to tap further our hidden sources of creative energies. We can then give of ourselves more freely in conversation, retreat less often behind empty word systems, and so develop a sense of mutual understanding and rapport. In order that this may become a reality we must practice the art of listening. Only then shall we face the truth within ourselves, and avoid self-betrayal through falsities, illusions, rationalizations and neurotic solutions.'

With the above statement, Dr. Barbara concludes *The Art of Listening*. Essentially, the book is an attempt to establish and delineate the importance of effective and facile communication upon mental health. The author declares that 'psychotherapy might perhaps best be defined as an effort at improving the ability of the patient to communicate with himself and with others.' The role of listening in communicating with ourselves and others is given continuous attention and emphasis. In reading the book, one's conviction grows that listening is the most important of the various communicative processes.

The author considers communication to be a molar process involving cyclical and simultaneous relationships among action, perceptions, and reactions, unconscious as well as conscious. Separate chapters contain interesting profiles of such unhealthy listeners as the logical type listener, the emotional type listener, the complaint listener, the deaf-eared listener.

Similarly, the several chapters draw sharp pictures of ineffective therapists at work. Consider the following examples:

1. The Anxious Talkative Therapist is described: 'This is usually the therapist, who, because of his own inner needs to succeed and achieve results in his work with others, is too eager to get ahead or to control and influence his patients.'

2. The 'So-Called' Silent Therapist is identified: 'In this group we find the therapist, who, because of his own fear of involvement or intrusion, conducts overcautiously and, unable to tackle a problem directly, is fearful of struggle and anxiety.'

3. Of the Soothing Therapist, Dr. Barbara says he is one '. . . who because of his own sense of compliancy and a need for unobtrusiveness, tends to bend over backwards and to place too much stress in pleasing his patient and putting him at constant ease.'

The author has combined in this book much psychoanalytic theory, much General Semantics theory and some of the recent research in the field of Listening Comprehension. The result is an important introduction to the part to be played by aural perception in the problems of mental health and adjustment.

Two limitations seem to exist in this book: (1) The concepts of mental health and 'good' listening are presented in a rather confused schema. The reader is not quite certain whether Dr. Barbara feels that 'good' listening can be achieved only after attaining mental health, or whether mental health can be achieved only with the development of 'good' listening. (2) The author clearly and specifically outlines certain problems; but his handling of solutions to these problems, any explanation of how one might learn to develop and practice the 'art of listening' is unfortunately left too generalized in form. Perhaps for greater specificity of approach, we must

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await the appearance of a subsequent volume.

RALPH NICHOLS
GEORGE SHAPIRO
University of Minnesota

Author's Comment: Needless to say, it is gratifying for an author to receive a preview of the review of his book and, at the same time, to be given an opportunity of offering his comments.

Let me begin by saying that I was pleased that the reviewers, especially since they are experts in the subject of listening, have found in my book what I had hoped they would. They listened, so to speak, and productive communication took place. They succinctly summarized the main ideas in the *Art of Listening* and astutely delineated some of the major subdivision.

Now, briefly as to their constructive criticisms about some of the limitations that seem to exist in the book: About the first one, allow me to clarify further. I envision listening as an alive, dynamic and growing process. Listening and mental growth, I feel, are segments of one and the same process—namely, that of communication. Neither one need precede or follow the other. In essence, good listening leads to effective communication, which in turn facilitates mental growth. Conversely, the more healthy a person is, the better he will listen, and the more effective will be his communication. In this context, listening, communication and mental growth are dynamically interrelated.

Regarding the second limitation, I agree with the reviewers only in part. One will find definite techniques in this book in mastering the art of listening. However, with more research in the field of listening comprehension, there will be greater specificity of approach. Finally, as the reviewers conclude, this could be an incentive for a subsequent volume.

DOMINIC A. BARBARA
New York

CYPREANSEN, LUCILLE, WILEY, JOHN H., and LAASE, LEROY T., *Speech Development, Improvement and Correction*. New York: The Ronald Press, 1959. Pp. 353. $5.00.

The authors preface this text with the statement that it has been written 'for the beginning courses in speech correction methods for students training to teach in the elementary school and for students training to become public school speech therapists.' As the title indicates, the authors have attempted to cover three important areas in relatively small space. Of necessity, each area is treated in a rather simple, sometimes superficial manner, with no one area given intensive analysis.

It will become apparent rather quickly to the professional therapist that, as the authors state, this is 'not a text for the speech pathologist or the advanced speech therapist.' While it is not designed to answer the questions currently being asked by experienced public school speech therapists seeking new approaches to both speech improvement and correction, many therapists will find it extremely useful as resource material for their own use and for the use of the classroom teachers who express interest in the field. In addition, approximately one-third of the text is devoted to creative play and choral speaking selections. Teachers and therapists who approach speech improvement through the use of these techniques will find their favorite selections. Several traditional rhymes and stories, as well as examples of a variety of dramatizations, are included.

Part I covers 'The Speech Development of the Child' and provides a documented discussion of normal and deviant speech patterns, lightly spiced with a few flashes of humor. The chapters in this section deal with 'Normal Speech Development,' 'Deviations from Normal Speech,' 'Speech Training and Retraining,' and 'Understanding Speech Problems.' The authors have kept semantic confusion to a minimum by refraining from the use of the more elaborate and technical terms so dear to the hearts of speech pathologists. Here, the lay person *can* tell the players without a program, and the classroom teacher should have no difficulty in translating from the text to the child.

Part II illustrates 'Finding Individual Speech Needs.' Only a few pages are devoted to 'Keeping Individual Records,' and further explanation of the details of the testing and recording procedures would be desirable. For those unfamiliar with speech therapy, the inclusion of the picture articulation test may prove helpful. Included in this section are test sentences for children of various age levels. It would appear that the reading level of the sentences suggested for use with older children might be difficult for the junior or senior high student with a speech problem, who often exhibits reading difficulties as well.

'Methods and Graded Materials' constitute Part III of the text, and include 'Teaching

the Production of Speech Sounds,' 'Teaching Sound Formations,' 'Speech Games in Graded Sequence,' 'Improvement Through Creative Play,' and 'Improvement Through Choral Speaking.' Therapists may find the nonsense syllable material listed in this section can be used in therapy as a separate entity. Through-the-mill therapists will be disappointed that only 15 pages of the entire text are given to 'Speech Games in Graded Sequence' and that not a few of the games suggested require permanent therapy quarters with sufficient storage space.

To summarize, the authors have presented material which will be especially helpful to both embryonic and full-blown classroom teachers who are interested in the field of speech and speech improvement. College instructors in the field of speech therapy may find the text useful in a survey course, or as a supplemental text in a course for the beginning speech therapist.

KATHARINE BUTLER
Kalamazoo, Michigan

Author's Comment: Dr. Wiley, Dr. Cypreansen and I have each read the review of our book by Katharine Butler. We have no comment for publication. We think the review is fair enough. She recognizes the book for what it is intended to be. The main limitations, which she cites in the book, are those which we believe to be inherent in a book of the sort which we were trying to write.

LEROY T. LAASE
The University of Nebraska

GRAY, GILES W., and WISE, CLAUDE M., *The Bases of Speech* (third edition). New York: Harper and Bros., 1959. Pp. 562. $6.00.

The third edition of *The Bases of Speech* is composed of nine chapters dealing successively with the social, the physical, the physiological, the neurological, the phonetic, the linguistic, the psychological, the genetic, and the semantic bases of speech. It is a treasure-trove of information about speech, for each chapter is filled with selected information assembled through painstaking research.

Although this text is not devised for courses in the improvement of a student's speech, it does suggest in many instances a procedure by which acceptable performance can be attained. Every teacher of speech should be acquainted with the information provided by this book. Many speech teachers are well-versed in two or three of the aspects of speech, but few are familiar with the information pertaining to all of them. Workers in the field of speech and hearing therapy, for example, have been well prepared for work with the exceptional child and adult, but they often have been poorly prepared in other aspects of the field in which they work. The study of this book would make it possible for them to be more adequately prepared in more phases of speech.

In order that students may be provided with the information available in this book, two procedures seem available: (1) The book can be used as a text in a required course, or (2) it can be used as a reference work for collateral reading for certain courses. Ideally, the student should have the overview of speech provided in this book as early as possible in his academic program; however, a required course based on this book scheduled in the freshman or sophomore year might chill some students' enthusiasm for speech. Therefore, the reviewer recommends that an upper division course, based on this book, be required of all students pursuing a major or minor in speech with the expectation of becoming teachers.

Readers will note that the authors' frequent and somewhat confusing use of the class term 'speech' when their discussion relates to 'American speech.' The discussion of the mechanics of speech and of phonetics perhaps gives too little emphasis to the dynamic aspects of the speech process. Although this book would not be recommended for advanced treatment of any particular subject it discusses, it can bring broad insight to the beginner and a broadening of perspective to the specialist.

F. LINCOLN HOLMES
Illinois State Normal University

Editor's Note: This review was sent to the authors, but no comment was submitted.

JOHNSON, WENDELL, and ASSOCIATES, *The Onset of Stuttering*. Minneapolis: The University of Minnesota Press, 1959. Pp. 519. $5.00.

For many years, the absorbing problem of the causation of stuttering has stimulated speech pathologists to discover more about the factors which surround its onset in the individual. This book, authored by Dr. Johnson and his associates, presents the findings of three studies, dating from 1934. The scope of the questions asked in the interviews of parents and the large number of

children and families studied are unmatched in stuttering research.

Study I examined responses obtained by interviewing parents of 46 diagnosed stutterers, ages two to seven, and a matched group of parents of nonstuttering children. Study II (conducted by Frederic Darley) studied two groups of 50 each, ages two to 14; and Study III, conducted from 1952-1957, interviewed parents of two matched groups of 150 children each, ages two to eight years. In the last study, each of the 600 fathers and mothers was given an 818-item interview. Graduate students interested in case study methods will profit from an examination of the plan of this study. The 243-page Appendix provides the complete list of items covered in the interviews with a tabulation of responses.

The findings of Study III showed that the children who were considered stutterers and the children in the control group who were not so diagnosed were essentially similar. In general, any group differences indicated differences in parental evaluations and influences, such as less favorable ratings on social development, more pressures in early training, and more expressed worries for the children, among those parents who believed that their children stuttered. There were also more stuttering relatives for the experimental group. Although the two groups were more alike than different, these findings stood out: The experimental group parents (1) demanded more fluency, (2) were more dissatisfied with their children, (3) imposed higher standards and (4) gave evidence of more tension in the home.

The parents of the experimental group could not remember accurately what gave rise to the first behaviors that were named stuttering. Such situations as were recalled seemed commonplace, neither dramatic nor unusual. The average age of onset was the fourth year, near the third birthday. Control group parents also reported nonfluencies prevalent around the third year. The early stutterings were reported as repetitions, mostly sounds and syllables, with little tension displayed. Most parents indicated that the problem came on gradually. The later stuttering varied greatly and showed more fluctuation in severity.

Johnson concludes from this research that the problem of stuttering at its onset involves interaction between listener and speaker. The listener makes an evaluative judgment of the nonfluencies of the speaker, nonfluencies which are remarkably similar to the repetitions and hesitations in the speech of children not thought to be stuttering. The problem then lies in 'the ear' of the listener and in the judgments he formulates and makes evident about the child and his speech. The child perceives his listener's reactions and proceeds to evaluate his own speech in the light of those reactions. As a result, he tends to inhibit and disrupt his speech attempts. The interactions in the speaking situation have led him to conclude that his repetitions and hesitations are shameful and to be avoided at all costs.

Most speech clinicians will already be familiar with Johnson's beliefs. They have probably asked themselves many times: Does this child, so soon to be diagnosed as a stutterer, have nonfluencies which may be different from the average, which attract the listener's attention and concern? Would it be possible that conclusions about his communication begin with the child? Johnson has many answers in his discussion of three variables: the listener's sensitivity to the speaker's nonfluencies, the speaker's degree of nonfluency, and the speaker's sensitivity to his nonfluency and his listener's reaction to it. The concluding chapter should be examined by all beginning clinicians who believe too quickly and conclusively that 'something is wrong with this child.' The child they see may be reacting normally to an abnormal listening situation. From this book, experienced clinicians will gain greater understanding of Dr. Johnson's point of view by reviewing the research from which the semantogenic theory evolved.

ELISE HAHN
University of California at Los Angeles

Author's Comment: I sympathize with Dr. Hahn and other reviewers of *The Onset of Stuttering*, because the more than 500 pages of tables, presumably factual sentences, and theoretical conclusions which it contains all but defy condensation and evaluation within the confines of a review of reasonable length. I should like to say, first of all, therefore, that I am pleased by the conscientious and competent effort which Dr. Hahn has made to present essential information about the book.

To me, the most interesting and significant aspects of the quarter-century of research represented by *The Onset of Stuttering* are not the findings concerning speech and factors related to it, important as these are in my judgment, but rather the methodological problems involved. One of the most basic of these, faced by every in-

vestigator of human behavior problems, centers around this question: From whom and by what means can desired information be obtained—and what are the limits beyond which no relevant information can be obtained from anyone by any means whatever? I have come through the experience of wrestling this question to the ground in my own fashion with a greatly deepened sensitivity to the awesome demands to be met by anyone who would aspire to produce even a single presumably true statement, not only about the problem called stuttering but about very nearly any other problem or situation involving human behavior and the evaluations made of it.

We appear to be credulous beyond belief in our reactions to such seemingly innocent and authoritative statements as, for example: 'One out of every hundred children is a stutterer,' or 'Stuttering usually begins in childhood but may also have its onset in adulthood,' or 'Stuttering may be caused by either organic or non-organic factors,' or 'Stuttering is (or is not) a psychoneurosis,' or 'Stuttering is (or is not) hereditary.' From our schools and our general culture we evidently gain only a very meager awareness, if any whatever, of all that is involved in determining precisely what any such statement might conceivably be about, or the specific means by which the raw data upon which it presumably has been based could have been reliably obtained from which particular informant, by which specific investigator, precisely where, exactly when.

The statements we take to be factual are, to me, much less engrossing than the evaluational processes by which we persuade ourselves that they are, indeed, factual. The thinking that men have done—and the thinking we do today—about all that we variously mean by 'stuttering' seems even more in need of scientific investigation than do the phenomena, real or imagined, that the thinking has been, and is, about—so far, that is, as these phenomena can be reliably identified.

If reflections of this sort stimulate you, I am quite sure the pages of *Onset* you will find the most interesting are 3-12, 43-46, 117-131, 169-180 (report of clinical follow-up studies of cases), 216-220 (overlap of 'stuttering' and 'nonstuttering' children on measures of speech nonfluency), and 236-264 (tentative conclusions presented as an interactional theory that is considerably different from any of my previously published ventures into theory).

Incidentally, in spite of what seemed like abnormal meticulousness, I let some errors get by. One rather important one is in Table 6, page 58. The total numbers and mean numbers of illnesses given there should be changed to read, for the control group, 456 and 3.05, and for the experimental or stuttering group, 447 and 3.00. The error was made in totaling the undated diseases summarized in item 148A, page 42 of the Appendix. I shall appreciate information from any of you regarding other errors that you may detect.

I included in the Appendix the complete interview of over 800 items and the responses made to it by some 800 informants, with the hope that others with varied interests and theoretical preferences might find in the mass of data implications and leads for further research that I have overlooked. I hope that the data presented in the book will be scrutinized fully as much as the conclusions that my particular orientation influenced me to draw from them at the time of writing.

WENDELL JOHNSON
State University of Iowa

JOHNSON, WENDELL, *Toward Understanding Stuttering*. Chicago: National Society for Crippled Children and Adults, Inc., 1959. Pp. 36. $ .25.

On the striking cover of the booklet the third word of the title is displayed in type larger than the other two; and this word, *stuttering*, appears to label the behavior of a lad whose full-face picture fills most of the page. The lad pictured here is apparently caught in a stuttering block.

The pages under this interesting cover tell the story of man's search for a cure for stuttering. They tell it cleverly, dramatically, candidly. When the 1934 milepost is reached, the story becomes chiefly the account of the investigation of the role played by the listener in the causation of stuttering. Dr. Johnson explains well the thesis that stuttering is a reflection of a certain interpersonal relationship which develops between some speakers and some listeners.

The tract has had loving care in its writing. It is not only written with clarity; it is also composed with elegance and beauty of style. The style of the writing would seem to indicate that the tract is intended for the lay person—perhaps for the stutterer himself, or for his friends, parents and relatives. It seems best suited to the lay person of above average intellectual sensitivity.

The author gives a hopeful turn to the old, old story about stuttering. It is the reviewer's guess that Dr. Johnson has promised more than many of his colleagues would. He says on page 1: 'The story of stuttering is a story of great hope. This traditionally baffling problem seems destined to follow in its own time the waning course of malaria and of many another form of human distress. And for essentially the same reasons. Our knowledge about stuttering is increasing as the result of scientific research, and so we are coming to understand better what to do about it and how to prevent it in the first place.'

All in all, the effect of the booklet will probably be wholesome and helpful. It will be purchased and read by thousands; and those thousands will be helped 'toward understanding stuttering' as one great speech scientist sees it.

ROBERT WEST
Brooklyn College

Author's Comment: I am pleased and heartened by Dr. West's gracious comments on *Toward Understanding Stuttering.*

The booklet was written at the request of Dr. Dean Roberts, Executive Director of the National Society for Crippled Children and Adults. It is one of a series of NSCCA booklets for parents on philosophical and practical approaches to various problems of childhood—and parenthood. It is based largely on *The Onset of Stuttering.* The reader should be warned perhaps that the tike who fathered the man who wrote the booklet gets a bit of attention in the first few pages.

Dr. West suggests that there are those who may consider me a mite optimistic in believing that continued research and public education based on laboratory and clinical findings will result in a steady and substantial reduction of the problem called stuttering. I do indeed believe that the data warrant this expectation—and I hope that dissemination of such information as that to be found in *The Onset of Stuttering* and *Toward Understanding Stuttering* will help to make this happy outcome all the more likely.

WENDELL JOHNSON
State University of Iowa

KOBRAK, HEINRICH G., *The Middle Ear.* Chicago: University of Chicago Press, 1959. Pp. 254. $15.00.

With few exceptions, most audiologists, psycho-acousticians, and others working in the field of hearing who are nonmedical in training, focus rather sharply on the problems of the inner ear and its receptor and on the central nervous system pathways of the auditory mechanism. Very frequently the middle ear is ignored, and differential diagnostic problems dealing with tympanic function are minimized in the literature and the teaching problems of audiologists.

With the recent growth in interest in otosurgical procedures for the improvement of hearing, more and more audiologists are becoming involved in conductive problems. As they search for definitive information on the function of the middle ear and on some of the medical problems involved in middle ear disease, they find a woefully inadequate otologic literature. Most of the literature extant gives very little weight to the physiological problems of the middle ear cavity and stresses almost entirely the large group of diseases which so frequently are encountered in the temporal bone. In these organic otologic sources, the function of the middle ear is not discussed with any degree of depth.

A refreshingly new approach to the problem has just come from the pen of a brilliant otologist whose untimely passing leaves an unfilled void in the hearts and minds of his contemporaries. Dr. Heinrich G. Kobrak spent more than a quarter of a century in deep investigative efforts in the middle ear. In his very well written text, '*The Middle Ear,*' he has for the first time presented a most comprehensive treatise on the middle ear cavity.

The first part of the book is uniquely important for audiologists and is entitled 'The Middle Ear in Health and Disease.' It includes excellent chapters on anatomy, on the nature of the physiologic stimulus, and on a number of aspects of middle ear physiology. It considers a number of facets of audiometry with special sections by Dr. Alvar Wilska and Dr. J. E. Fournier. He stresses his fascinating studies on the 'functional autopsy' of temporal bone specimens in which he was a pioneer.

Part II is largely of clinical interest to otologists and contains excellent discussions of otosclerosis pathology, mobilization of the stapes, and tympanoplasty. For the audiologist, Part II is primarily of reference value and it must be borne in mind that what has been written in these chapters by the contributors, Dr. John R. Lindsay, Dr. Samuel Rosen, Dr. H. Wullstein, and Dr. Fritz Zoellner, is a survey of current thinking in these otosurgical fields. As experi-

ence accumulates, technical changes are the rule rather than the exception, and many of the procedures are almost obsolete at the time of writing. Nevertheless, this section is of value in giving the nonmedical scientist interested in audition a very authoritative presentation in the pioneer work in these new surgical procedures by acknowledged experts.

It is in Part I, however, that the audiologist will find a gold mine of information on anatomy, embryology, physiology, and gross tympanic pathology, all of which will certainly contribute to a better understanding of the audiologic problems involved in middle ear deafness.

VICTOR GOODHILL
Los Angeles, California

Editor's Note: Because of the death of Dr. Kobrak prior to the publication of this book, his comments on the review could not be requested. However, a comment by Dr. Goodhill, the reviewer, seems pertinent. 'I knew Dr. Kobrak well, and believe that my review contains no controversial concepts or criticisms and that he has left us a very rich legacy which will serve as a very fitting memorial to his scientific industry and genius.'

PRONOVOST, WILBERT, with KINGMAN, LOUISE, *The Teaching of Speaking and Listening in the Elementary School.* New York: Longmans, Green and Co., 1959. Pp. 338. $4.50.

This book is intended as a text for elementary school teachers or for students planning a career in the elementary school field. It seeks to provide methods, materials and justification for integrating training in speaking and listening into the regular curriculum. Illustrative lessons comprise the bulk of the book and they demonstrate how speaking and listening experiences can be correlated with instruction and projects in social studies, science, arithmetic, music and the other elementary school subjects.

The text is organized about six main topics: Talks, Group Discussion, Voice Improvement, Articulation, Enunciation and Pronunciation, Oral Reading and Choral Speaking, and Dramatic Activities. A brief chapter on the importance of speaking and listening in the curriculum introduces the reader to the illustrative material and the book ends with a final chapter on ways to find and help children who are handicapped in speech and hearing.

We feel that in this book the authors have prepared a text for such courses as Speech for the Classroom Teacher and one which will be widely used. It is not primarily designed to interest the speech therapist.

CHARLES VAN RIPER
Western Michigan University

Author's Comment: While the book is not intended as a textbook for courses in speech therapy, practicing speech therapists have found it useful for in-service contacts with teachers. Speech therapists engaged in speech improvement programs have been using the materials in the chapters on Voice, Articulation, Enunciation, and Pronunciation, as well as the chapter on the Speech and Hearing Handicapped.

WILBERT PRONOVOST
Boston University

WISE, CLAUDE M., *Applied Phonetics.* New Jersey: Prentice-Hall, 1957. Pp. 546, $10.00. WISE, CLAUDE M., *Introduction to Phonetics.* New Jersey: Prentice-Hall, 1958. Pp. 251, $3.95.

The first of these volumes is essentially two books in one: an introduction to general phonetics and an examination of the phonetic features of several dialects of English. The second volume is a reprint of the first 10 chapters (parts one and two) of the larger volume, and includes the introduction to phonetics section and chapters on the three broad dialects of American English as well as one on 'Stage Speech' (Standard Southern British).

The larger book contains a chapter on each of 15 dialects of English, in addition to the 10 chapters of the shorter text. Part three contains five chapters on British regional dialects (Scottish, Cockney and Irish) and American Provincial dialects (New York City, Substandard Southern Negro, and Mountain). Part four explains the characteristics of dialects of English related to nine foreign languages. A chapter is devoted to each language, with a separate chapter devoted to 'Pennsylvania Dutch.'

Applied Phonetics is truly a scholarly work, one of a caliber we would expect from such an eminent phonetician and dialectician as Dr. Wise. Its documentation is thorough, its explanations are detailed, its style is clear and unpretentious, and its advice for the guidance of persons attempting to reproduce any of the dialects seems actually applicable, as the title suggests.

Speech therapists will find the dialect sections to be of great value as a handbook in conjunction with their work on foreign

dialect problems and even with some domestic dialect problems. How often the correctionists will struggle to help a person with a foreign dialect, armed with no more knowledge of phonetics or phonemics than that which is applicable to General American speech! Much time and effort is spent trying to 'observe' the features that the client has retained from his native speech. A careful study of the appropriate dialect chapter in this book should create an understanding of the clients' native speech background that would undoubtedly permit a therapist to proceed with greater confidence and efficiency in many cases.

Introduction to Phonetics seems to be quite complex and detailed for a beginning textbook. It is so carefully written, however, and includes so many details that it is a pleasure for one with some background in phonetics to read it as a 'refresher course.' Such a person might reasonably use it as a fundamental text if he were to proceed slowly, supplementing it with further explanation and exercises. Indeed, this may have been the author's intent, since he describes it as designed for a two-quarter or one-semester term, even though its 244 pages of text is no longer than some standard one-quarter course textbooks in phonetics.

The chapter on anatomy, physiology and physics is beautifully illustrated by H. S. Wise, M.D., the author's son.

WILLIAM FLETCHER
University of Minnesota

Editor's Note: The author has submitted no comment on the review of these two books.

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Mark of Our Age

It is customary to complain of the bustle and strenuousness of our epoch. But in truth the chief mark of our epoch is a profound laziness and fatigue; and the fact is that the real laziness is the cause of the apparent bustle. Take one quite external case; the streets are noisy with taxicabs and motor cars; but this is not due to human activity but to human repose. There would be less bustle if there were more activity, if people were simply walking about. Our world would be more silent if it were more strenuous. And this which is true of the apparent physical bustle is true also of the apparent bustle of the intellect. Most of the machinery of modern language is labour-saving machinery; and it saves mental labour very much more than it ought. Scientific phrases are used like scientific wheels and piston rods to make swifter and smoother yet the path of the comfortable. Long words go rattling by us like long railway trains. We know they are carrying thousands who are too tired or too indolent to walk and think for themselves. It is good exercise to try for once in a way to express any opinion one holds in words of one syllable. If you say 'The social utility of the indeterminate sentence is recognized by all criminologists as a part of our sociological evolution towards a more humane and scientific view of punishment,' you can go on talking like that for hours with hardly a movement of the gray matter inside your skull. But if you begin 'I wish Jones to go to gaol and Brown to say when Jones will come out,' you will discover with a thrill of horror, that you are obliged to think. The long words are not the hard words, it is the short words that are hard. There is much more metaphysical subtlety in the 'damn' than in the word 'degeneration.' (From *Orthodoxy* by G. K. Chesterton. New York: Dodd, Mead and Co. Copyright, 1936, by Gilbert K. Chesterton.)